



ECONOMIC ANALYSIS OF THE CRITICAL
HABITAT DESIGNATION FOR TEXAS
GOLDEN GLADECRESS AND NECHES RIVER
ROSE-MALLOW, EAST TEXAS

Draft Economic Analysis | March 14, 2013

prepared for:

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TABLE OF CONTENTS**EXECUTIVE SUMMARY ES-1****CHAPTER 1 INTRODUCTION AND BACKGROUND 1-1**

- 1.1 Introduction 1-1
- 1.2 Species Description 1-1
- 1.3 Previous Federal Actions 1-1
- 1.4 Proposed Critical Habitat Designation 1-2
- 1.5 Economic Activities Considered in this Analysis 1-10
- 1.6 Organization of the Report 1-10

CHAPTER 2 FRAMEWORK FOR THE ANALYSIS 2-1

- 2.1 Background 2-1
- 2.2 Categories of Potential Economic Effects of Species Conservation 2-4
- 2.3 Analytic Framework and Scope of the Analysis 2-6
- 2.4 Information Sources 2-15

CHAPTER 3 BASELINE PROTECTIONS 3-1

- 3.1 Endangered Species Act 3-1
- 3.2 United States Forest Service 3-2
- 3.3 Additional Conservation Measures and Considerations 3-3

CHAPTER 4 INCREMENTAL COSTS 4-1

- 4.1 Methodology for Isolating Incremental Impacts 4-1
- 4.2 Transportation-Related Activity in Critical Habitat 4-5
- 4.3 Land Management in Critical Habitat 4-9
- 4.4 Forest Management in Critical Habitat 4-10
- 4.5 Water Management in Critical Habitat 4-11
- 4.6 Utilities-Related Activity in Critical Habitat 4-11
- 4.7 Activities Not Expected to Occur in Critical Habitat 4-13
- 4.8 Conclusions 4-14

CHAPTER 5 ECONOMIC BENEFITS 5-1**REFERENCES R-1****APPENDIX A ADDITIONAL STATUTORY REQUIREMENTS A-1**

- A.1 Potential Impacts to Small Entities A-1
- A.2 Potential Impacts to Governments A-2
- A.3 Takings A-3
- A.2 Potential Impacts to the Energy Industry A-3

APPENDIX B INCREMENTAL MEMORANDUM PROVIDED BY THE SERVICE *B-1*

APPENDIX C UNDISCOUNTED STREAM OF COSTS FOR EACH SPECIES BY AGENCY AND
PARTY *C-1*

LIST OF ACRONYMS

Act	Endangered Species Act
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DOI	U.S. Department of the Interior
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
HCP	Habitat Conservation Plan
Hwy	Highway
IEc	Industrial Economics, Incorporated
LRMP	Land and Resources Management Plan
NRCS	Natural Resources Conservation Service
OMB	U.S. Office of Management and Budget
PFW	Partners for Fish and Wildlife
RFA	Regulatory Flexibility Act
ROW	Right-Of-Way
RUS	Rural Utilities Service
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SH	State Highway
Service	U.S. Fish and Wildlife Service
TxDOT	Texas Department of Transportation
UMRA	Unfunded Mandates Reform Act
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U. S. Forest Service

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts of designating critical habitat for the Texas golden gladeceess (*Leavenworthia texana*) and the Neches River rose-mallow (*Hibiscus dasycalx*). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).
2. The Service proposed the listing of Texas golden gladeceess as endangered and the Neches River rose-mallow as threatened under the Endangered Species Act (the Act) in September 2012.¹ At the same time, it proposed that approximately 1,353 acres be designated as Texas golden gladeceess critical habitat and 166² acres be designated as Neches River rose-mallow critical habitat³. All proposed critical habitat designations for the two species occur within seven counties in East Texas.⁴
3. This analysis first describes existing regulations providing protection afforded through listing under the Act for the Texas golden gladeceess and the Neches River rose-mallow and their habitats. These are “baseline” protections accorded the plants absent designated critical habitat. The discussion of regulatory baseline provides the context for the evaluation of economic impacts expected to result from critical habitat designation. These “incremental” economic impacts are those not expected to occur absent the designation of critical habitat and are the focus of this analysis. This study quantifies these potential incremental impacts stemming from the designation of critical habitat. This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from designation outweigh the benefits of including those areas in the designation.⁵

OVERVIEW OF THE PROPOSED DESIGNATION OF CRITICAL HABITAT

4. The area proposed for Texas golden gladeceess critical habitat designation consists of four units totaling 1,353 acres (539 hectares) in Sabine and San Augustine Counties, Texas (an overview map and detailed maps are provided in Chapter 1). All of the units are occupied by the plant. The area proposed for Neches River rose-mallow critical

¹ Proposed listing and critical habitat (2012), 77 FR 55968.

² The Service revised the original critical habitat acreage presented in the proposed rule for the Neches River rose-mallow to match the acreage designated in the GIS critical habitat maps for the species.

³ Proposed listing and critical habitat (2012), 77 FR 55968.

⁴ Ibid.

⁵ 16 U.S.C. §1533(b)(2).

habitat designation is comprised of 11 units totaling 166 acres (67 hectares) in Cherokee, Harrison, Houston, Nacogdoches, and Trinity counties in East Texas. Like the proposed critical habitat for the gladecress, all of the proposed units for the rose-mallow are occupied by the plant.

DISCUSSION OF RESULTS

5. The designation of critical habitat for the Neches River rose-mallow is likely to result in only minor administrative impacts. This result is attributed to several factors, including (1) all units are occupied by the plant and will require consultation regardless of the designation and (2) project modifications necessary to avoid adverse modification of critical habitat are indistinguishable from those necessary to avoid jeopardizing the species (see the Service's reasoning in Appendix B). All incremental costs are administrative in nature and result from the consideration of adverse modification in section 7 consultations.
6. The designation of critical habitat for the Texas golden gladecress is also likely to result in relatively minor administrative impacts. In addition, minimal project modifications are likely to result from the designation of critical habitat. These minor impacts are attributed primarily to very few projects with a federal nexus being envisioned within the critical habitat designation for the plant. Because the life history and biology of the plant can make detection difficult, we conservatively assume in this analysis that all consultations are triggered by the presence of critical habitat alone (i.e., pre-project surveys do not identify the plant). Even with this assumption, impacts are expected to be minimal because of the relatively small number of activities anticipated to occur within the critical habitat for the Texas golden gladecress. The primary activities expected to result in section 7 consultations and trigger project modifications are routine transportation projects and utility-related activities. Land management projects undertaken to enhance habitat for the plant are also expected to take place on private land within critical habitat for Texas golden gladecress with funding from the Service's Partners for Fish and Wildlife (PFW).
7. We anticipate twenty-three potential section 7 consultations, three formal and twenty informal, for the Texas golden gladecress. Six of these consultations with the Service, three formal and three informal, are expected to result from routine roadway safety projects in the ROWs in Units 1, 3, and 4 managed by the Texas Department of Transportation (TxDOT) through a nexus with the U.S. Department of Transportation (USDOT). Twelve informal consultations are expected to result across the units for PFW projects through a nexus with the Service (an intra-service consultation). The distribution of these consultations among units is based on the estimated number of private landowners associated with each unit. The remaining five informal consultations are expected to result from utility work by local electric cooperatives through a nexus with the Rural Utilities Service (RUS), an agency of the U.S. Department of Agriculture (USDA).
8. The Service lists all units as occupied, but also notes the difficulties in identifying the plant during surveys. Under the conservative assumption that no survey identifies the

Texas golden glade cress, all section 7 consultations are expected to result solely from the presence of critical habitat designation. Therefore, these consultations considering adverse effects to habitat would not occur but for the designation. In addition to the administrative costs of approximately \$116,000 in present value terms (assuming a seven percent discount rate over a 20 year period), the Service may request incremental project modifications.⁶ For transportation projects, the costs of altering road projects, such as installing narrower road shoulders than TxDOT might otherwise prefer, include the increased safety risk associated with such changes, net of cost savings associated with smaller installation costs. For utility projects, the costs of moving utility pole placement during construction and changing pole maintenance activities would be considered incremental. These project modification costs are expected to be minor and are not quantified in this report due to data limitations. Project costs associated with beneficial PFW activities are also considered incremental for the Texas golden glade cress as they would not be expected to occur but for the critical habitat designation. Total project modification costs are estimated to be \$362,000 in present value terms (assuming a seven percent discount rate over a 20 year period).

9. We anticipate sixteen potential section 7 consultations, thirteen informal and three formal, for the Neches River rose-mallow. In Units 1 and 4, routine roadway maintenance and safety projects in ROWs managed by the TxDOT will likely require approximately two formal and two informal consultations with the Service through a nexus with the USDOT, the Federal agency providing at least partial funding for TxDOT projects. Unit 4 will likely be affected by the construction of the proposed Columbia Reservoir, and thus we anticipate a formal consultation with the Service through a nexus with the U.S. Army Corps of Engineers (the Corps). Units 5-8 in the Davy Crockett National Forest potentially could be affected by a change in the management plan governing land management in the Forest, expected to be complete by 2015. Because the plan is expected to increase conservation measures for the plant, we anticipate one informal section 7 consultation with the Service through a nexus with the U.S. Forest Service (USFS). The remaining ten informal consultations are anticipated to occur for activities carried out by regional electric cooperatives in East Texas through a nexus with RUS. These consultations were assumed to occur with equal probability in any Unit except the four located on National Forest land.
10. Given the presence of the plant in all of these affected units, the consultations would occur but for the designation. Therefore, incremental impacts are approximately \$29,000 in present value terms (assuming a seven percent discount rate over a 20 year period), and are limited to the additional administrative costs of considering the potential for the projects to adversely modify critical habitat.

⁶ A discount rate is the interest rate used in determining the present value of past or future payments. The discount rates employed in this analysis follow Office of Management and Budget (OMB) guidance. A more detailed explanation on the application of the discount rate in determining present value and annualized costs can be found in Section 2.3.5 and Exhibit 2-4.

11. Incremental costs are summarized in Exhibit ES-1.⁷ For future one-time consultations for which we do not have information regarding timing, we conservatively assume costs are incurred immediately following promulgation of the final rule (in 2013). Total costs in present value terms assuming a seven percent discount rate over a 20 year period are \$510,000.⁸ In conformance with Office of Management and Budget (OMB) guidance, we also report present value impacts and impacts on an annualized basis applying real discount rates of three and seven percent.

⁷ In Appendix C, we present the undiscounted stream of costs for each species by agency and party over the 20 year study timeframe.

⁸ Total may not sum due to rounding.

EXHIBIT ES-1. TOTAL ESTIMATED INCREMENTAL IMPACTS BY UNIT AND BY SPECIES (\$2012)

SPECIES	UNIT	UNDISCOUNTED COST	PRESENT VALUE		ANNUALIZED VALUE	
			3 PERCENT	7 PERCENT	3 PERCENT	7 PERCENT
Neches River rose-mallow	1: Highway 94 ROW	\$11,000	\$8,300	\$6,100	\$540	\$540
	2: Harrison County	\$3,400	\$2,600	\$1,900	\$170	\$170
	3: Lovelady	\$3,400	\$2,600	\$1,900	\$170	\$170
	4: Highway 204 ROW	\$16,000	\$13,000	\$11,000	\$870	\$980
	5: Davy Crockett NF, compartment 55	\$470	\$460	\$440	\$30	\$39
	6: Davy Crockett NF, compartment 11	\$470	\$460	\$440	\$30	\$39
	7: Davy Crockett NF, compartment 20	\$470	\$460	\$440	\$30	\$39
	8: Davy Crockett NF, compartment 16	\$470	\$460	\$440	\$30	\$39
	9: Champion	\$3,400	\$2,600	\$1,900	\$170	\$170
	10: Mill Creek Gardens	\$3,400	\$2,600	\$1,900	\$170	\$170
	11: Camp Olympia	\$3,400	\$2,600	\$1,900	\$170	\$170
Texas golden glade	1: Geneva	\$190,000	\$160,000	\$130,000	\$10,000	\$12,000
	2: Chapel Hill	\$77,000	\$66,000	\$55,000	\$4,300	\$4,800
	3: Southeast Caney Creek Glades	\$51,000	\$41,000	\$33,000	\$2,700	\$2,900
	4: Northwest Caney Creek Glades	\$370,000	\$310,000	\$260,000	\$20,000	\$23,000
	TOTAL		\$610,000	\$510,000	\$40,000	\$45,000

Source: IEc calculations.

Notes:

- (1) Present value impacts are annualized over the period of analysis, 2013 through 2032, or 20 years.
- (2) For the costs incurred due to consultations with USDOT/Texas Department of Transportation, the costs are distributed evenly over the 20 year period reflecting the fact that two consultations are expected to take place at some point over the next 20 years.
- (3) The incremental costs for the information consultation anticipated for the revision of the Land and Resource Management Plan are divided equally by the four NF Units affected by this activity. Additionally, while these costs do include biological assessment, they do not include third party participation.
- (4) Incremental costs associated with utility activities are divided equally between the appropriate units since the precise locations of future activities are unknown; incremental costs associated with PFW projects are distributed among the units based on number of private landowners within each Unit.
- (5) Totals may not sum due to rounding.

POTENTIAL BENEFITS OF CRITICAL HABITAT DESIGNATION

12. The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as Texas golden gladeceess and Neches River rose-mallow. Thus, attempts to develop monetary estimates of the benefits of this proposed critical habitat designation would focus on the public's willingness to pay to achieve the conservation benefits to these two plants resulting from this designation. Because modifications to future projects are not anticipated at this time for the Neches River rose-mallow as a result of critical habitat designation, in this instance, critical habitat designation likely will add minimal incremental conservation benefits to those already provided by baseline conservation actions. While the designation may modestly influence the probability that Texas golden gladeceess will be conserved, the published valuation literature does not support monetization of such changes for this species.

POTENTIAL IMPACTS TO SMALL ENTITIES AND THE SUPPLY, DISTRIBUTION, OR USE OF ENERGY

13. No small entities are likely to be significantly affected by the designation of critical habitat. In addition, we do not anticipate measurable impacts to the supply, distribution, or use of energy.

KEY SOURCES OF UNCERTAINTY

14. To the extent that future economic activity is uncertain, this analysis may have failed to identify projects or land use alterations that may occur within habitat. However, given the stated conditions, project modifications due to critical habitat designation are unlikely for Neches River rose-mallow and minimal in cases where they do occur for Texas golden gladeceess.

CHAPTER 1 | INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

15. This chapter provides an overview of proposed critical habitat for Texas golden gladeceess and Neches River rose-mallow. We include a description of the two species, a summary of past publications and legal actions that relate to the current proposal, a summary of land ownership within the current proposal, maps of the proposed units, and a summary of threats to the proposed critical habitat. All official definitions and boundaries should be taken from the Proposed Rule.⁹

1.2 SPECIES DESCRIPTION

16. Texas golden gladeceess is a small, annual, herbaceous plant belonging to the mustard family. It occurs within the Pineywoods natural region of easternmost Texas. The plant is endemic to glade habitats in northern San Augustine County and northwest Sabine County, Texas, and is a habitat specialist, occurring only on outcrops of the Weches Geologic Formation. The gladeceess grows only in glades on shallow, calcium-rich soils that are wet in winter and spring and is restricted to the outcrop rock faces within the glades where it occurs.¹⁰ The Texas golden gladeceess is small in stature, with a window of flowering and producing fruit that is limited to between February and early April, making it is difficult to find. Additionally, the species may not emerge in a given area during a given year because of drought conditions.
17. Neches River rose-mallow is a nonwoody perennial plant that produces six or seven creamy white flowers during the summer months. The rose-mallow is endemic to relatively open habitat of the Pineywoods of East Teas. Sites where rose-mallow has been found have been described as sloughs, oxbows, terraces, and sand bars and have water-saturated soils. Sites include perennial and intermittent wetlands.¹¹ The Neches River rose-mallow is sufficiently distinctive to identify and locate within its habitat year-round, even in drought conditions.

1.3 PREVIOUS FEDERAL ACTIONS

18. Below, we summarize key milestones in the Federal regulatory history for Texas golden gladeceess and Neches River rose-mallow

⁹ Proposed listing and critical habitat (2012), 77 FR 56011-56026.

¹⁰ Ibid., 55970-55971.

¹¹ Ibid., 55973-55974.

- **Listing:** Texas golden gladeceess was proposed to be listed as an endangered species and Neches River rose-mallow was proposed to be listed as a threatened species under the Act on September 11, 2012.¹²
- **Proposed critical habitat designation:** The Service concurrently proposed critical habitat designations for the two plant species with the proposed listings on September 11, 2012. In this proposed rule, the Service proposed to designate 1,353 acres as critical habitat for the Texas golden gladeceess¹³ and 166 acres as critical habitat for the Neches River rose-mallow in seven counties in East Texas.¹⁴

1.4 PROPOSED CRITICAL HABITAT DESIGNATION

19. The rule proposes to designate 1,353 acres across 4 units in 2 East Texas counties as critical habitat for the Texas golden gladeceess and 166 acres across 11 units in 5 East Texas counties as critical habitat for the Neches River rose-mallow. Exhibits 1-1 and 1-2 provide information concerning the landownership for the proposed designations. All proposed units are considered to be currently occupied by Texas golden gladeceess or Neches River rose-mallow, respectively.¹⁵
20. We define the “study area” for this Economic Analysis as including all lands proposed for critical habitat designation. Exhibits 1-3 through 1-8 provide overview maps of the study area as well as detailed satellite images of the terrain surrounding each unit.

¹² Ibid., 55967.

¹³ Proposed listing and critical habitat (2012), 77 FR 55993.

¹⁴ The Service revised the original critical habitat acreage presented in the proposed rule for the Neches River rose-mallow to match the acreage designated in the GIS critical habitat maps for the species.

¹⁵ Proposed listing and critical habitat (2012), 77 FR 55993.

EXHIBIT 1-1. SUMMARY OF LAND MANAGEMENT/OWNERSHIP IN PROPOSED CRITICAL HABITAT FOR THE TEXAS GOLDEN GLADECRESS

UNIT	FEDERAL ACRES	STATE AND LOCAL ACRES	PRIVATELY OWNED ACRES	TOTAL UNIT ACRES	% OF UNIT THAT IS PRIVATE
1: Geneva	0	7	381	388	98%
2: Chapel Hill	0	3*	147	150	98%
3: Southeast Caney Creek Glades	0	3	37	40	93%
4: Northwest Caney Creek Glades	0	8	767	775	99%
Total	0	21	1,332	1,353	98%

Source: Proposed listing and critical habitat (2012). 77 FR 56000; and IEc calculations.

Notes:

Totals may not sum due to rounding.

* County owned.

EXHIBIT 1-2. SUMMARY OF LAND MANAGEMENT/OWNERSHIP IN PROPOSED CRITICAL HABITAT FOR THE NECHES RIVER ROSE-MALLOW

UNIT	FEDERAL ACRES	STATE AND LOCAL ACRES	PRIVATELY OWNED ACRES	TOTAL UNIT ACRES	% OF UNIT THAT IS PRIVATE
1: Highway 94 ROW	0	0.8	1.7	2.5	68%
2: Harrison County	0	0	20.8	20.8	100%
3: Lovelady	0	0	4.6	4.6	100%
4: Highway 204 ROW	0	6.2	0	6.2	100%
5: Davy Crockett NF, compartment 55	2.8	0	0	2.8	0%
6: Davy Crockett NF, compartment 11	5.3	0	0	5.3	0%
7: Davy Crockett NF, compartment 20	2.4	0	0	2.4	0%
8: Davy Crockett NF, compartment 16	23.8	0	0	23.8	0%
9: Champion	0	0	2.9	2.9	100%
10: Mill Creek Gardens	0	0	95.0	95.0	100%
11: Camp Olympia	0	0	0.2	0.2	100%
Total	34.3	7.0	125.2	166.5	75%

Source: Proposed listing and critical habitat (2012). 77 FR 56003; and IEc calculations.

Note: Totals may not sum due to rounding.

EXHIBIT 1-3. OVERVIEW MAP OF PROPOSED TEXAS GOLDEN GLADECRESS CRITICAL HABITAT

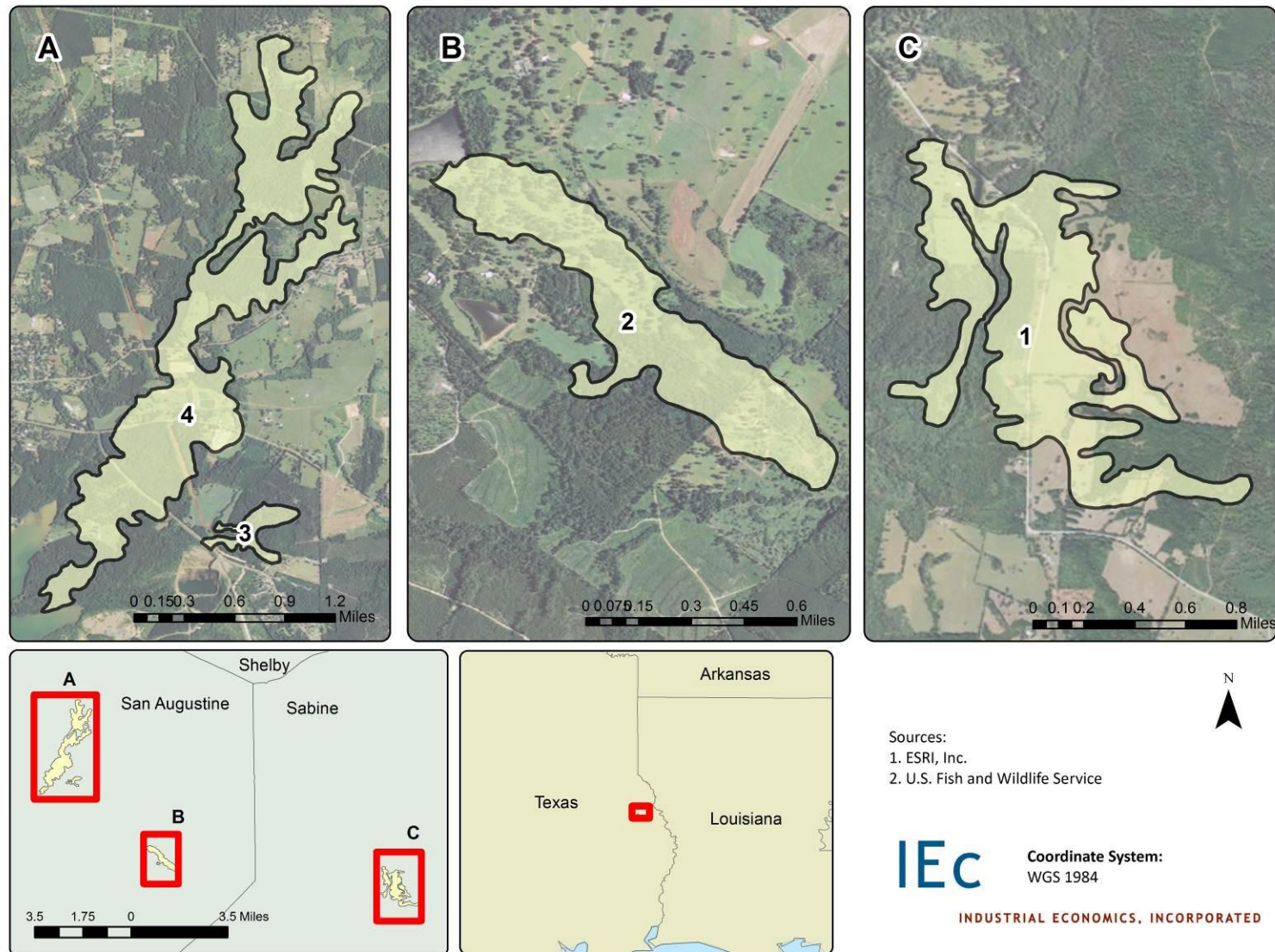
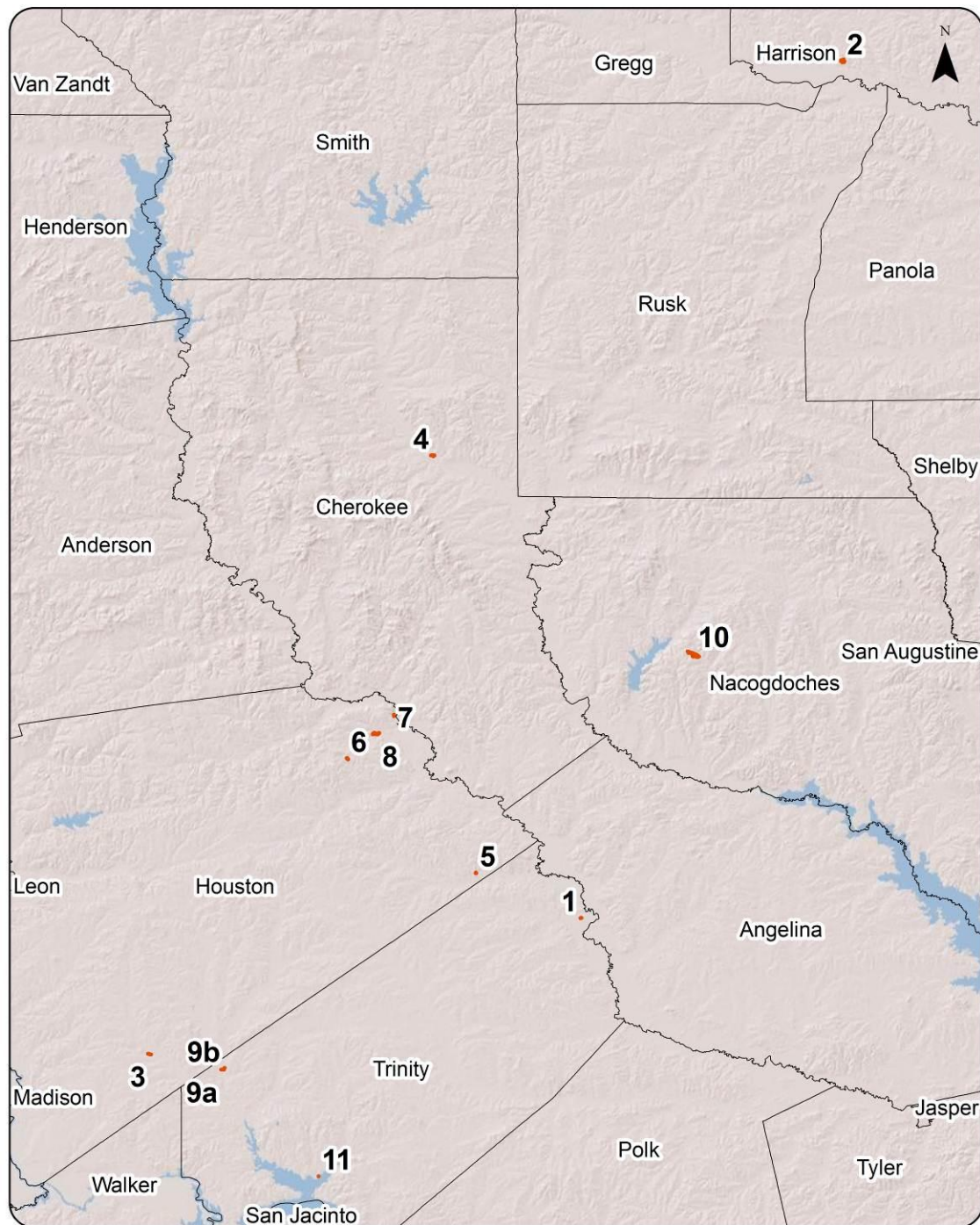


EXHIBIT 1-4. OVERVIEW MAP OF PROPOSED NECHES RIVER ROSE-MALLOW CRITICAL HABITAT



1:750,000

0 3.5 7 14 21 28
Miles

Sources:
1. ESRI, Inc.
2. U.S. Fish and Wildlife Service

IEc

Coordinate System:
WGS 1984

INDUSTRIAL ECONOMICS, INCORPORATED

EXHIBIT 1-5 NECHES RIVER ROSE-MALLOW PROPOSED CRITICAL HABITAT - UNITS 1 AND 5

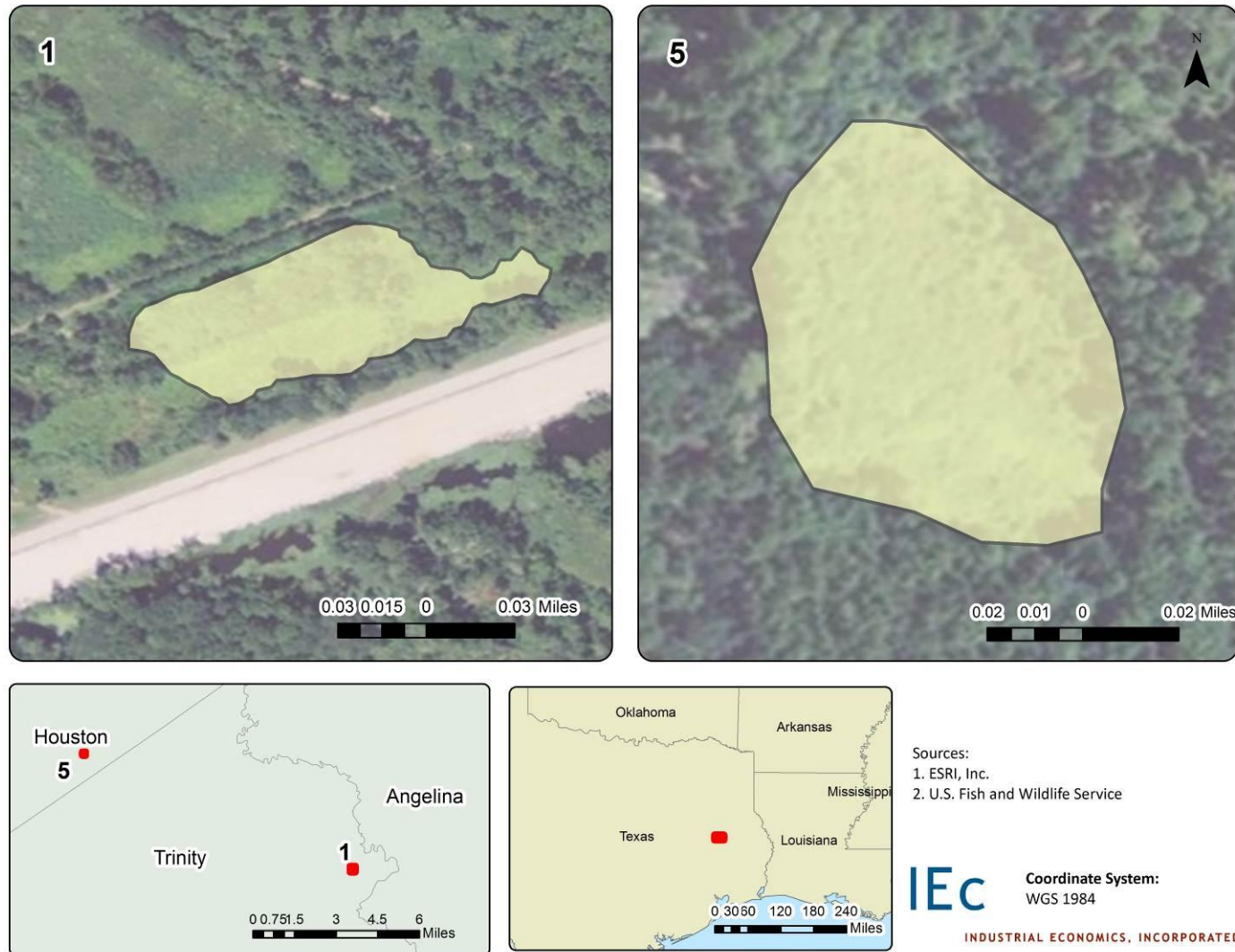
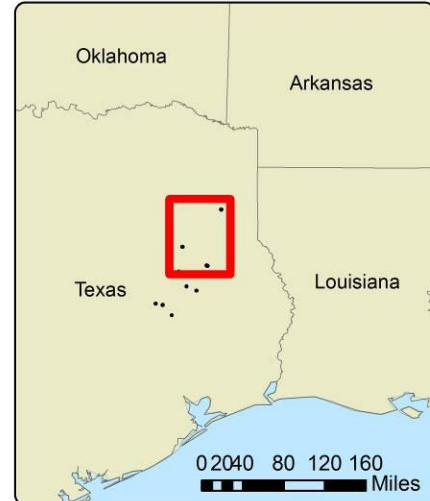
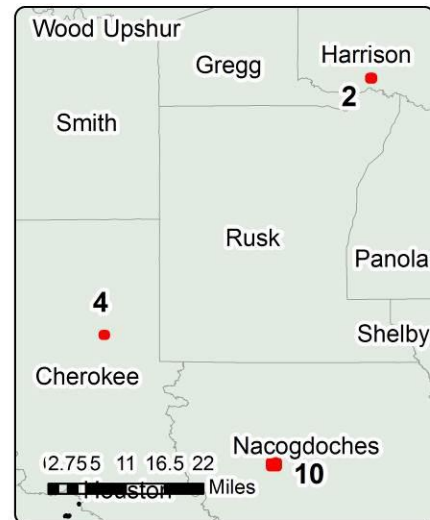
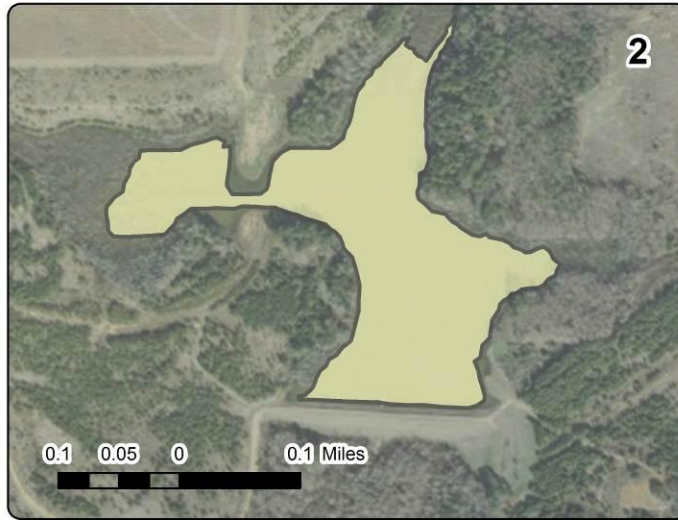


EXHIBIT 1 -6 NECHES RIVER ROSE-MALLOW PROPOSED CRITICAL HABITAT - UNITS 2, 4, AND 10



Sources:
1. ESRI, Inc.
2. U.S. Fish and Wildlife Service



IEc

Coordinate System:
WGS 1984

INDUSTRIAL ECONOMICS, INCORPORATED

EXHIBIT 1-7 NECHES RIVER ROSE-MALLOW PROPOSED CRITICAL HABITAT - UNITS 3, 9, AND 10

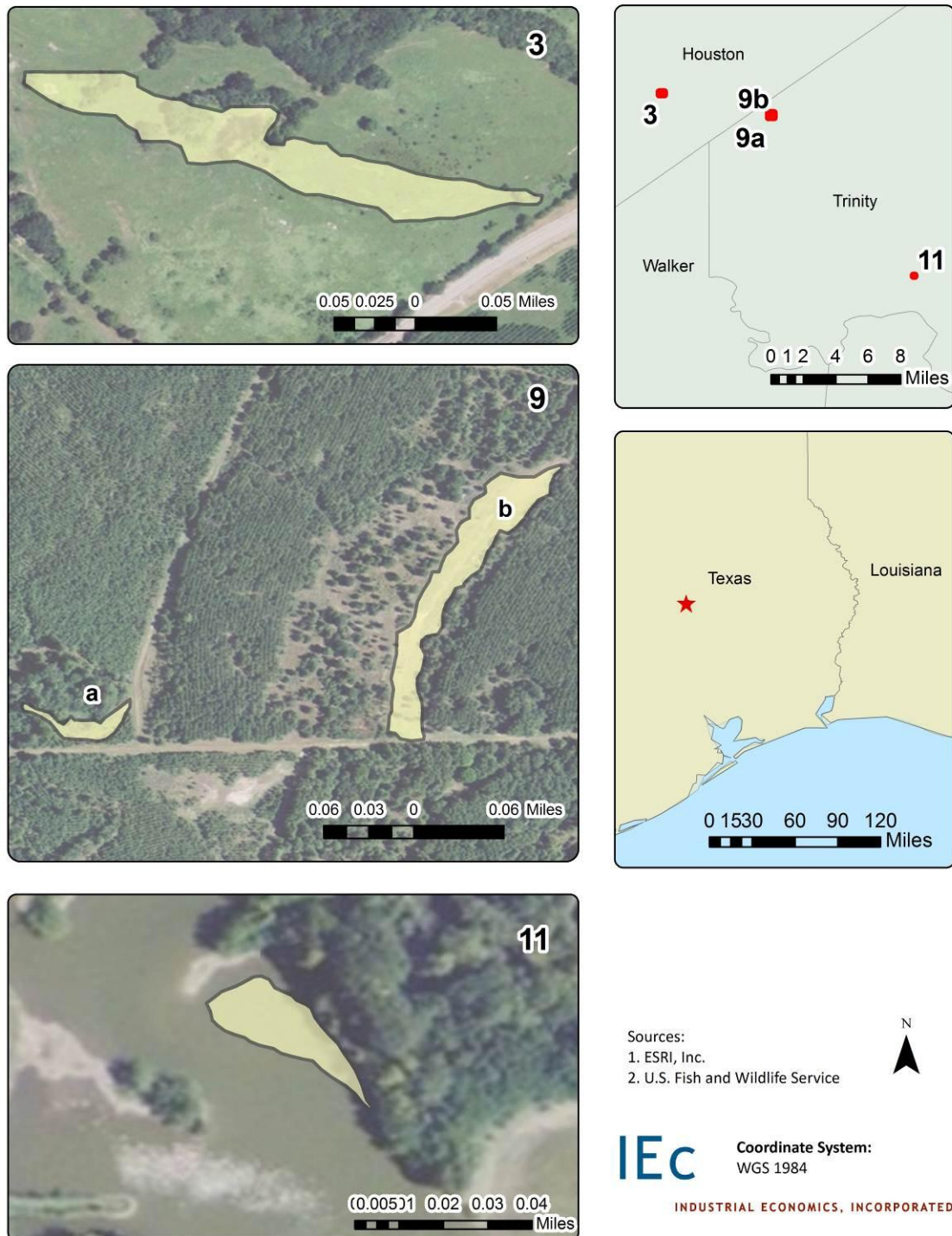
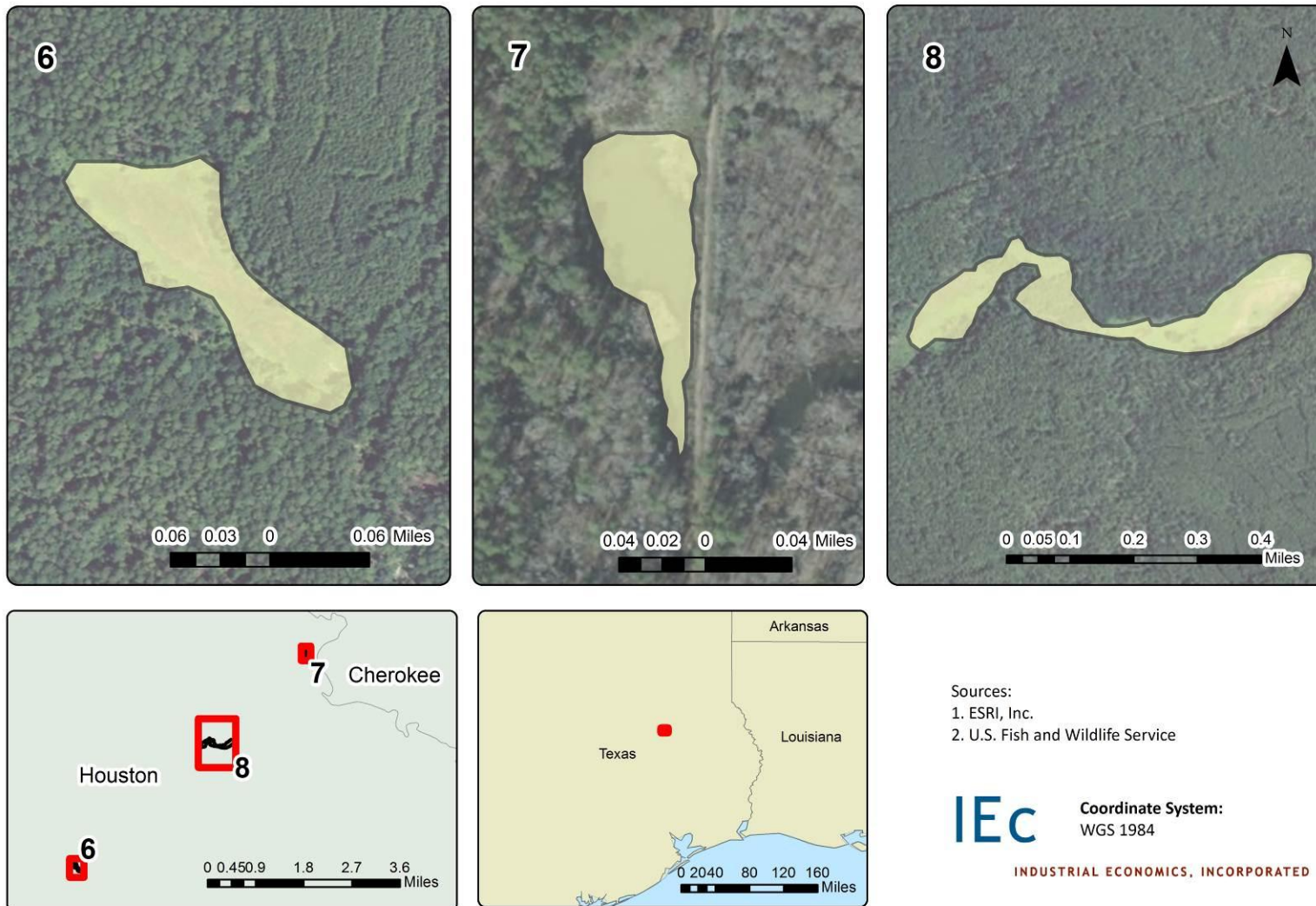


EXHIBIT 1-8 NECHES RIVER ROSE-MALLOW PROPOSED CRITICAL HABITAT - UNITS 6, 7, AND 8



1.5 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

21. Based on information provided in the Proposed Rule and discussions with the Service, conservation efforts to protect Texas golden gladeceess and Neches River rose-mallow may affect the following economic activities.
- **Transportation (minor road widening and maintenance) and energy infrastructure projects.** Roadway and bridge construction and maintenance projects may involve mowing or herbicide application, activities that threaten the plant species directly. TxDOT safety projects may involve minor roadway widening, an activity that may directly impact plant populations and indirectly impact the species by adversely modifying suitable habitat. Energy infrastructure projects, primarily the construction and maintenance of interstate natural gas pipelines, may also threaten the plant communities.
 - **Land management.** Land management activities, including quarrying of glauconite, development and infrastructure, grazing, mowing/haying, timber and poultry production, herbicide application, fire suppression, , wildlife habitat improvements, nonnative invasive species treatment, encroachment of nonnative and native woody and weedy vegetation, prescribed burns to control vegetation, and disaster response, may adversely disturb or alter the natural plant community.
 - **Water management.** Altered hydrology stemming from water management projects, such as the creation of a reservoir, can adversely modify the riparian habitat of the Neches River rose-mallow resulting in the decline or loss of the plants.

1.6 ORGANIZATION OF THE REPORT

22. The remainder of this report proceeds through four additional chapters. Chapter 2 discusses the framework employed in the analysis. Chapter 3 describes the baseline protections currently afforded to Texas golden gladeceess and Neches River rose-mallow. Chapter 4 provides an assessment of potential incremental economic impacts to transportation, land management, and water management activities. Finally, Chapter 5 briefly describes the potential benefits of the critical habitat designation.
- Chapter 2 – Framework for the Analysis
 - Chapter 3 – Baseline Protections
 - Chapter 4 – Incremental Costs
 - Chapter 5 – Economic Benefits
23. In addition, the report includes three appendices: Appendix A, which considers potential impacts on small entities and the energy industry; Appendix B, which provides the basis for identifying the incremental effects of critical habitat designation.

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

24. The purpose of this report is to estimate the economic impact of actions taken to protect Texas golden gladeceess and Neches River rose-mallow and their respective habitats. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the two species and their habitats within the proposed critical habitat area. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections otherwise accorded the two plants; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat.
 25. This information is intended to assist the Secretary of DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹⁶ In addition, this information allows the Service to address the requirements of Executive Orders 12866 (as amended by 13563), 13211, and 12630, the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), and the Unfunded Mandates Reform Act (UMRA).¹⁷
 26. This chapter describes the framework for this analysis. First, we describe case law that led to the selection of the framework applied in this report. Next, we describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits. We conclude with a presentation of the information sources relied upon in the analysis.
- 2.1 BACKGROUND**
27. OMB's guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as

¹⁶ 16 U.S.C. §1533(b)(2).

¹⁷ Executive Order 12866, Regulatory Planning and Review, September 30, 1993 (as amended by Executive Order 13563 (2011)); Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, March 15, 1988; Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. § 601 et seq; Pub Law No. 104-121; and 2 U.S.C. 1501, et seq.

the "best assessment of the way the world would look absent the proposed action."¹⁸ In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

28. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.¹⁹ Specifically, the court stated,

"The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act]."²⁰

29. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.²¹ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

¹⁸ OMB, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>.

¹⁹ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

²⁰ *Ibid.*

²¹ In explanation of their differing conclusion, later decisions note that in *New Mexico Cattle Growers*, the U.S. Tenth Circuit Court of Appeals relied on a Service regulation that defined "destruction and adverse modification" in the context of section 7 consultation as effectively identical to the standard for "jeopardy." Courts had since found that this definition of "adverse modification" was too narrow. For more details, see the discussion of *Gifford Pinchot Task Force v. United States Fish and Wildlife Service* provided later in this section.

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep’t of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service’s baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a designation, the world with the designation must be compared to the world without it.’”²²

30. More recently, in 2010, the U.S. Ninth Circuit Court of Appeals came to similar conclusions during its review of critical habitat designations for the Mexican spotted owl and 15 vernal pool species.²³ Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.
31. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis:
 - Describes the baseline protections afforded Texas golden glade cress and Neches River rose-mallow absent critical habitat designation (Chapter 3); and
 - Monetizes the potential incremental impacts precipitated specifically by the designation of critical habitat for these species (Chapter 4).
32. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under Section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.²⁴ Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat.²⁵ At this time the Service is analyzing whether destruction or adverse modification would occur based on the statutory language of the Act itself, which requires the Service to consider whether the agency’s action is likely “to result in the destruction or adverse modification of habitat which is determined by the Service to be critical” to the conservation of the species. To

²² *Center for Biological Diversity et al, Plaintiffs, v. United States Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

²³ *Home Builders Association of Northern California v. United States Fish and Wildlife Service*, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); *Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. Lexis 1362, 79 U.S.L.W. 3475 (2011).

²⁴ Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

²⁵ *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

perform this analysis, the Service considers how the proposed action is likely to impact the ability of critical habitat to carry out its intended function and conservation role. A detailed description of the methodology used to define baseline and incremental impacts is provided in Chapter 3.

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

33. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect Texas golden gladeceess and Neches River rose-mallow and their habitats (hereinafter referred to collectively as “Texas golden gladeceess conservation efforts” or “Neches River rose-mallow conservation efforts,” respectively)²⁶. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of Texas golden gladeceess or Neches River rose-mallow conservation efforts.
34. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts.

2.2.1 EFFICIENCY EFFECTS

35. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect Texas golden gladeceess or Neches River rose-mallow habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.²⁷

²⁶ These efforts include project modifications that may be undertaken by Federal agencies as a result of consultation with the Service.

²⁷ For additional information on the definition of “surplus” and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

36. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a section 7 consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.
37. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market. Given the small number of acres proposed for designation in this case, measurable market impacts are not anticipated.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

38. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.²⁸ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

39. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.²⁹ It also assesses the potential for impacts to State, local, and Tribal governments and the private sector as required by Title II of UMRA.³⁰ Finally, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect

²⁸ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

²⁹ 5 U.S.C. §5601 *et seq.*

³⁰ 2 U.S.C. 1531 *et seq.*

Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.³¹

Regional Economic Effects

40. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
41. The use of regional input-output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
42. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.
43. Given the limited nature of incremental impacts likely to result from this designation (see Chapter 4), measurable regional impacts are not anticipated.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

44. This analysis: 1) identifies those economic activities most likely to impact Texas golden gladeceess and Neches River rose-mallow and their habitats; 2) describes the baseline regulatory protection for these species; and 3) monetizes the incremental economic impacts to avoid adverse modification of the proposed critical habitat areas. This section provides a general description of the methodology used by the Service to separately

³¹ Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

identify baseline protections from the incremental impacts stemming from the designation of critical habitat. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed critical habitat rulemaking. Further discussion of this methodology specific to Texas golden glade cress and Neches River rose-mallow is provided in Chapter 3.

2.3.1 IDENTIFYING BASELINE IMPACTS

45. The baseline for this analysis is the existing state of regulation as a federally listed species, prior to the designation of critical habitat, which provides protection to the species under Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.
46. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes these baseline regulations. The primary focus, however, is not on baseline costs, since these will not be affected by the proposed critical habitat regulation. Instead, the focus of this analysis is on monetizing the incremental impacts forecast to result from the proposed critical habitat designation.
 - Section 7 of Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.
 - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."³² With respect to endangered plants, among other prohibitions, it is unlawful under the Act to import such species into or export such species from the United States, to remove and reduce to possession any such species from areas under Federal jurisdiction, and to maliciously damage or destroy any such species in any such area under Federal jurisdiction.³³ The economic impacts associated with this section manifest themselves in sections 7 and 10.

³² 16 U.S.C. 1532.

³³ 16 U.S.C. 1538(a)(2).

- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.³⁴ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

47. If the Service determines that an action jeopardizes either plant, it could recommend one or more of the following project modifications (this is not an exhaustive list):
- a. avoiding plants by conducting preconstruction surveys, typically when the plants are in bloom for easier identification,
 - b. flagging live individuals or a whole population in the project footprint,
 - c. maintaining a biological monitor on-site to stop activities and coordinate a solution with the Service if a listed plant may be impacted during project-related activities,
 - d. conducting projects at various distances from individual plants to protect their habitat,
 - e. drilling directionally for construction of a pipeline,
 - f. avoiding excavation or construction upon or upslope of population sites,
 - g. avoiding introduction of nonnative plants into glade sites,
 - h. practicing active management to remove woody vegetation that is encroaching into glades,
 - i. establishing signage and fencing to exclude vehicle, pedestrian, or cattle access,
 - j. maintaining sufficient distance from glades with pine tree plantings such that mature trees do not shade, or contribute leaf litter to, the glade habitats,
 - k. implementing seasonal restrictions or modifications to projects occurring within occupied habitat to enable recovery of the species,
 - l. providing conservation measures to restore, enhance, and protect habitat,
 - m. incorporating a range of ‘best management practices’ to protect a species and its habitat,

³⁴ U.S. Fish and Wildlife Service, “Endangered Species and Habitat Conservation Planning,” August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

- n. implementing *in-situ* conservation to reintroduce individuals within occupied habitat coupled with long-term adaptive management monitoring, and
 - o. offsetting permanent habitat loss, modification, or fragmentation³⁵ resulting from agency actions with habitat that is permanently protected, including adequate funding to ensure the habitat is managed permanently for the protection of the species³⁶.
48. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act (CWA) or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

49. This analysis quantifies the potential incremental impacts of the critical habitat designation component of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from existing required or voluntary conservation efforts being undertaken due to other Federal (i.e. listing as threatened or endangered under the Act), State, and local regulations or guidelines.
50. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the listed species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts (i.e., reasonable and prudent alternatives) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline (without critical habitat designation) and are considered incremental impacts of the rulemaking.
51. Incremental impacts may be the direct compliance costs associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional conservation efforts that would not have been requested under the jeopardy standard. Additionally, incremental impacts may include

³⁵ Habitat loss, modification, or fragmentation of Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands. In other words, lands protected as mitigation from habitat loss should not be Federal lands that are already under some form of protection or management.

³⁶ U.S. Fish and Wildlife Service, Memorandum from Field Supervisor, Corpus Christi, Texas, Field Office to Industrial Economics, Inc., Cambridge, Massachusetts, "Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow," September 2, 12, pp. 3, 7.

indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., implementing Texas golden glade cress or Neches River rose-mallow conservation in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

Direct Impacts

52. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the incremental administrative costs of conducting a section 7 consultation; and 2) implementation of any conservation efforts requested by the Service through section 7 consultation to avoid potential destruction or adverse modification of critical habitat.
53. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers (the Corps). Often, they will also include a third party involved in projects that involve a permitted entity, such as the recipient of a CWA section 404 permit.
54. During a consultation, the Service, the Action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.
55. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussions between the Service, the Action agency, and the applicant concerning an action that may affect a species but that will not adversely affect the listed species because effects are discountable, insignificant, or beneficial, or that will not adversely modify critical habitat. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action is likely to adversely affect the listed species or adversely modify designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

Administrative Section 7 Consultation Costs

56. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may affect a species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
57. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation -**
New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
 2. **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity (but for which the project or activity is not yet completed) may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.
 3. **Incremental consultation resulting entirely from critical habitat designation -** Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by a listed species. All associated administrative and project modification costs of these consultations are considered incremental impacts of the designation.
58. Because the listing of these plants is taking place concurrently with the proposal of critical habitat, the second scenario described above is not expected to occur. Additionally, all proposed critical habitat units are occupied by its respective plant, reducing the likelihood that the third scenario described above would happen.
59. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with multiple Service field offices resulted in a range of estimated administrative costs of

consultation. For simplicity, the average of the range of costs in each category is applied in this analysis (see Exhibit 2-3).

Section 7 Conservation Effort Impacts

60. Section 7 consultation considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For future consultations considering jeopardy and adverse modification, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated conservation efforts are assumed to be incremental impacts of the designation.
61. With regard to the types of project modifications that may be recommended by the Service to avoid adversely modifying critical habitat, the Service states that its recommendations would essentially be the same as the modifications discussed above recommended to avoid jeopardy.³⁷ Thus, when the plant is present at the site, incremental project modifications are unlikely. However, in some limited instances, a project may affect the primary constituent elements (PCEs) without affecting the plant. In these cases, project modifications would be attributed incrementally to the designation.
62. All proposed critical habitat units for the Neches River rose-mallow are occupied by the plant. Based on our conversations with the Service, we understand these units are relatively small; and projects affecting the PCEs without also affecting the plant are unlikely.³⁸ Therefore, any project modification undertaken as a result of a section 7 consultation is expected to serve as protection against jeopardizing the species. For this reason, the designation of critical habitat for the Neches River rose-mallow is unlikely to result in incremental conservation efforts and their associated costs.
63. All proposed units of critical habitat for the Texas golden gladeceess are known to be occupied. Based on our conversations with the Service, we understand that the natural history and biology of the plant can render detection during a survey uncertain. However, based on the plants dependence on specific habitat requirements, the critical habitat is still considered occupied. It is therefore possible that project modifications stemming from a section 7 consultation may be recommended for the prevention of adverse modification if the plant is not detected during surveys in the critical habitat designation. Because of the uncertainty associated with projecting whether future surveys will discover the plant at a given time, it is difficult to prospectively assign project modification impacts to the baseline or incremental scenarios. In this analysis, therefore, projected project modifications for the Texas golden gladeceess are conservatively assumed to all be incremental, though in reality, at least some may occur in the baseline. As a result, we are more likely to overstate, than understate, the incremental impacts of the designation.

³⁷ Ibid., p. 8.

³⁸ Personal communication. Region 2 Senior Listing Biologist, Southwest Regional Officer, and Biologists, US FWS. 10 October 2012; Personal communication. Region 2 Senior Listing Biologist, USFWS. 31 October 2012.

64. Further discussion on distinguishing incremental effects from baseline effects, including a flowchart illustrating the classification of incremental and baseline effects for each of the two plant species is found in section 3.3.

EXHIBIT 2-3. RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS (2012 DOLLARS)

CONSULTATION TYPE ³⁹	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$570	n/a	\$1,050	n/a	\$1,620
Informal	\$2,450	\$3,100	\$2,050	\$2,000	\$9,500
Formal	\$5,500	\$6,200	\$3,500	\$4,800	\$20,000
Programmatic	\$16,700	\$13,900	n/a	\$5,600	\$36,100
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	\$428	n/a	\$788	n/a	\$1,220
Informal	\$1,840	\$2,330	\$1,540	\$1,500	\$7,130
Formal	\$4,130	\$4,650	\$2,630	\$3,600	\$15,000
Programmatic	\$12,500	\$10,400	n/a	\$4,200	\$27,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$285	n/a	\$525	n/a	\$810
Informal	\$1,230	\$1,550	\$1,030	\$1,000	\$4,750
Formal	\$2,750	\$3,100	\$1,750	\$2,400	\$10,000
Programmatic	\$8,330	\$6,930	n/a	\$2,800	\$18,100
INCREMENTAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION					
Technical Assistance	\$143	n/a	\$263	n/a	\$405
Informal	\$613	\$775	\$513	\$500	\$2,380
Formal	\$1,380	\$1,550	\$875	\$1,200	\$5,000
Programmatic	\$4,160	\$3,460	n/a	\$1,400	\$9,030
Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2008, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to three significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

Indirect Impacts

65. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the

³⁹ We include technical assistance and programmatic consultation types in the table for reference; however, we do not anticipate either type of consultation resulting from critical habitat designation for the Texas golden glade and Neches River rose-mallow. Technical assistance consultations are less involved than informal consultations and generally entail the exchange of information regarding the status of species and information on species' distributions and life cycles. Programmatic consultations are similar to formal consultations but are generally much larger, encompassing a range of activities linked to a regional or state-wide program.

Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. For example:

- **Triggering Other State and Local Laws.** Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation. Based on discussions with the Service and relevant State and local agencies, such indirect effects are unlikely for this designation.⁴⁰
- **Time Delays.** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to initiate the section 7 consultation process and/or compliance with other laws triggered by the designation.⁴¹ To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation. Based on the anticipated types of section 7 consultations as well as the close working relationships that exist between most of the nexus agencies considered in this analysis and the Service, we do not anticipate significant incremental time delays for projects.
- **Regulatory Uncertainty or Stigma** Government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether reasonable and prudent alternatives will be recommended by the Service and what the nature of these alternatives will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated conservation efforts and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. As the public becomes aware of the true regulatory effects imposed by critical habitat, the impact of the designation on property markets may decrease. Data allowing for the quantification of such effects are generally unavailable.

⁴⁰ Personal communication. Region 2 Senior Listing Biologist, Southwest Regional Officer, and Biologists, US FWS. 10 October 2012; Personal communication. Jennifer Adams, TxDOT. November 2012; Personal communication. Tom Philipps, USFS. November 2012; Personal communication. Janet Ritter, District Conservationist, NRCS. November 2012; Personal communication. Jennifer Walker, Chief, Permits Section Regulatory Branch, USACE. November 2012.

⁴¹ Such a reinitiation of the consultation process need is not of concern with either the Texas golden gladeecress or the Neches River rose-mallow due to the concurrent proposed listings and critical habitat designations for the two species.

2.3.3 BENEFITS

66. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.⁴² OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits* and *ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.⁴³
67. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.⁴⁴ *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
68. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

69. Economic impacts of Texas golden gladeceess conservation and Neches River rose-mallow conservation are considered across the entire area proposed for critical habitat designation, respectively, as defined in Chapter 1. Results are presented by proposed critical habitat unit.

2.3.5 ANALYTIC TIME FRAME

70. Ideally, the time frame of this analysis would be based on the time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). However, absent specific information on the expected time frames for recovery of Texas golden gladeceess and Neches River rose-mallow, this analysis

⁴² Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

⁴³ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

⁴⁴ Ibid.

forecasts impacts over a “reasonably foreseeable” time frame. Based on available data, this analysis considers economic impacts to activities from 2013 (expected year of final critical habitat rule) through 2032, 20 years. OMB supports this time frame stating that, “for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years.”⁴⁵

2.3.5 PRESENTATION OF RESULTS

71. Impacts are described in present value and annualized terms applying discount rates of seven percent throughout the body of the report. Additionally, Chapter 4 provides the present and annualized value of impacts in each unit applying a three percent discount rate for comparison with values calculated at seven percent⁴⁶. Present value and annualized impacts are calculated according to the methods described in Exhibit 2-4.

⁴⁵ U.S. Office of Management and Budget, February 7, 2011. “Regulatory Impact Analysis: Frequently Asked Questions (FAQs).” Accessed on May 3, 2011 by http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf.

⁴⁶ The OMB requires Federal agencies to report results using discount rates of three and seven percent (see OMB, Circular A-4, 2003).

EXHIBIT 2-4. CALCULATING PRESENT VALUE AND ANNUALIZED IMPACT

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in current dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) from year t to T is calculated using 2013 as the base year, according to the following standard formula:^a

$$PV_c = \sum_t^T \frac{C_t}{(1+r)^{t-2013}}$$

C_t = cost of Texas golden gladeceess and Neches River rose-mallow critical habitat conservation efforts in year t

r = discount rate^b

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are also calculated to illustrate the stream of payments in equivalent annual payments over a particular time period (T). For this analysis, we assume a forecast period of 20 years, 2013 through 2032. Annualized future impacts (APV_c) are calculated by the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1 - (1+r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, 20 years)

^a To derive the present value of future impacts to development activities, t is 2013 and T is 2032.

^b To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

Note: In this analysis, we calculate present value costs using 2013 as the base year; the unit cost information, however, rely on values based on 2012 dollars. Thus, all tables in this report are labled as presenting costs in "2012 dollars".

2.4 INFORMATION SOURCES

72. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, local governments and other stakeholders. In addition, this analysis relies upon existing conservation plans that consider Texas golden gladeceess or Neches River rose-mallow. A complete list of references is provided at the end of this document.

CHAPTER 3 | BASELINE PROTECTIONS

73. This chapter discusses the baseline conservation measures protecting Texas golden gladeceess and Neches River rose-mallow absent the designation of critical habitat. The species and habitat baseline protections described in this chapter result from listing these species under the Act, as well as other Federal, State and local regulations and conservation plans. Baseline conservation measures for the plants include the cost of existing measures that protect the listed plants to avoid jeopardy to the species. The qualitative discussion included in this chapter provides the context for the incremental analysis resulting from critical habitat designation in Chapter 4.
74. The baseline protections described in the following sections address potential threats to the Texas golden gladeceess and the Neches River rose-mallow and their habitats. Review of the proposed rule and the incremental effects memorandum from the Service identified the following economic activities as potential threats to the Texas golden gladeceess and its habitat: (1) quarrying of glauconite; (2) natural gas and oil exploration, production and distribution; and (3) conversion of land to pine tree plantations. For the Neches River rose-mallow, the Service identified water management activities that alter hydrology, as a potentially threatening economic activity. In addition to these direct economic activities, several threats are identified that may be indirectly related to economic activities. These include encroachment of woody species, herbicide application and grazing practices.
75. Because the Texas golden gladeceess and the Neches River rose-mallow are proposed for listing concurrently with the proposed critical habitat designation, no prior section 7 consultation histories exist for either species documenting protective measures taken. Anticipated regulatory circumstances without critical habitat, however, are described in the incremental effects memorandum from the Service and are summarized in the following section.
- 3.1 ENDANGERED SPECIES ACT**
76. As described in Section 2.3, baseline protections afforded the Texas golden gladeceess and Neches River rose-mallow under the Act include sections 7, 9, and 10 to the extent that they are expected to occur absent the designation of critical habitat for these species.
77. Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations considering the potential for a project or plan to jeopardize the species result in administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.

78. In the absence of critical habitat, a variety of Federal agencies would be expected to consult with the Service under section 7 for a range of projects. In Exhibit 3-1, we provide a summary of the potential section 7 consultations that could result from the listing of the Texas golden gladeceess and the Neches River rose-mallow.

EXHIBIT 3-1. FEDERAL AGENCIES AND ACTIVITIES LIKELY TO UNDERGO BASELINE SECTION 7 CONSULTATIONS

FEDERAL AGENCY	ACTIVITY
U.S. Department of Transportation	Highway and bridge construction and maintenance
U.S. Fish and Wildlife Service	Partners for Fish and Wildlife (PFW) programs
U.S. Forest Service	Fire suppression
	Fuel-reduction treatments
	Land and resource management
	Oil and gas wells and pipelines
	Nonnative invasive species treatment
Natural Resource Conservation Service and Farm Services Agency	Technical and financial assistance for timber and poultry production, invasive plant control, and wildlife habitat improvements
Federal Energy Regulatory Commission	Issuance of permits for interstate oil pipelines
U.S. Department of Housing and Urban Development	Issuance of grants for municipal and residential construction and infrastructure projects
U.S. Army Corps of Engineers	Issuance of permits for wetland crossings
	Issuance of permits for activities in jurisdictional wetlands
U.S. Department of Homeland Security (Federal Emergency Management Agency)	Disaster response

Source: U.S. Fish and Wildlife Service, Memorandum from Field Supervisor, Corpus Christi, Texas, Field Office to Industrial Economics, Inc., Cambridge, Massachusetts, "Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow," September 2, 2012, p. 5-6.

79. A variety of modifications to project activities that jeopardize the Texas golden gladeceess or the Neches River rose-mallow have been suggested by the Service. As discussed above, because the listing of the two species is concurrent with their respective critical habitat designations, there is no history of section 7 consultations for either species allowing for the examination of actual project modifications undertaken. Such baseline protective measures may include avoiding plants by conducting preconstruction surveys, implementing seasonal restrictions, implementing the project a protective distance from plants, flagging live individuals or a whole population in the project footprint, and having a biological monitor on-site to stop activities and coordinate a solution with the Service if a listed plant may be impacted during project-related activities. The Service may also recommend directionally drilling of a pipeline in wetlands. In addition, the Service may recommend modifications to proposed actions, providing conservation measures to restore habitat, incorporating a range of best

management practices to protect the species and their habitats, offsetting habitat loss or implementing *in-situ* conservation to reintroduce the plants or offsetting permanent habitat loss.

3.2 UNITED STATES FOREST SERVICE

80. The USFS actively manages habitat for the Neches River rose-mallow. Within Davy Crockett National Forest in East Texas, four populations of the plant, each in a separate Unit, comprising a total of 81.5 percent of the range-wide population are known to occur. The Land and Resource Management Plan that governs the management of this forest allows for mechanical means and prescribed fire to maintain the native plant community and prohibits the use of herbicides unless applied by hand or in a non-aqueous form within 100 feet of the Neches River rose-mallow.
81. In addition, without critical habitat designation, some protection benefits will be provided to the Neches River rose-mallow by the National Forest Management Act of 1976. This Act directs that the National Forest System "... where appropriate and to the extent practicable, will preserve and enhance the diversity of plant and animal communities."
82. The Texas golden gladeceess and conditions suitable for its habitat are not known to occur within a national forest. Therefore the baseline conservation measures described in this section and resulting from the Davy Crockett National Forest Land and Resource Management Plan and the National Forest Management Act apply only to the Neches River rose-mallow.

3.3 ADDITIONAL CONSERVATION MEASURES AND CONSIDERATIONS

83. The Texas Land Conservancy purchased and manages a 30 acre tract of private land known as the Hibiscus Preserve in Houston County in East Texas for the Neches River rose-mallow. The tract of land provides benefits to just over three percent of the range-wide population of the Neches River rose-mallow and contributes to the plant's conservation by protecting a population of the plant and its habitat. By minimizing development, the Texas Land Conservancy is maintaining the ecological value of the land for the plant. This protection is considered baseline because it would occur absent the designation of critical habitat.
84. Texas golden gladeceess has benefitted to a limited degree from it co-occurrence at some sites with the federally endangered white bladderpod (*Physaria pallida*). For example, management activities such as brush clearing for the white bladderpod have resulted in the return of the gladeceess after a 10 year absence. Other recommended conservation measures for the white bladderpod that would be expected to benefit the Texas golden gladeceess include minimizing destruction or harm to the plant from unnecessary foot or vehicular traffic, invasive species introductions, or mowing during active growth seasons, as well as actively controlling existing invasions of glades by non-native and native woody plants. In general, the restoration and protection of habitat for the white bladderpod has benefited both the white bladderpod and the Texas golden gladeceess, where they co-occur.

85. Texas state law provides protection for State listed plants, including all federally listed species. Protections include prohibitions on removal of such plants for commercial sale; precluding any taking of endangered or threatened species from public lands for commercial sale, with similar prohibitions on taking from private land unless first obtaining a permit. No habitat protection is provided with State designation of the species. Exhibit 3.2 summarizes the sources of baseline habitat protection discussed in this chapter and indicates its applicability to the Texas golden gladeceess and the Neches River rose-mallow.

EXHIBIT 3-2. SUMMARY OF THE SOURCES OF BASELINE PROTECTION MEASURES FOR TWO TEXAS PLANTS

SOURCE OF BASELINE HABITAT CONSERVATION MEASURES	APPLICABLE PLANT	
	TEXAS GOLDEN GLADECRESS	NECHES RIVER ROSE- MALLOW
Federally listed status under the Endangered Species Act	✓	✓
National Forest Management Act of 1976		✓
Davy Crockett National Forest Land and Resource Management Plan		✓
Texas Land Conservancy's Hibiscus Preserve		✓
Federally listed status of the white bladderpod	✓	
Texas state law	✓	✓

Source: Incremental effects memorandum. Fish and Wildlife Service. 21 September 2012 and Proposed listing and critical habitat (2012). 77 FR 55993.

CHAPTER 4 | INCREMENTAL COSTS

86. In this chapter, we estimate the incremental costs of designating critical habitat for the two plant species. Data allow for the quantification of incremental administrative impacts. The incremental costs associated with project modifications are quantified where data are available or discussed qualitatively.
87. Due to the existing baseline protections already afforded the Neches River rose-mallow and described in Chapter 3, incremental costs of critical habitat designation for this species are likely limited to the additional administrative cost of considering adverse modification during section 7 consultations. Principally, the action of listing the plant as a threatened species and its current prevalence in the proposed critical habitat units will result in significant protection absent the designation.
88. Despite the existing baseline protections for the Texas golden gladeceess, the challenges of detecting this plant within the designated critical habitat due to its natural history may result in incremental conservation measures and associated costs due entirely to the existence of critical habitat designation. The plant's small size and limited window of flowering and producing fruit make it difficult to find. Additionally, the species may not emerge in a given area during a given year because of drought conditions.⁴⁷ Conservatively, we assume that the plant is never detected, and all administrative costs associated with consultations considering adverse modification as well as expected project modifications are incremental effects of the designation. In reality some of these costs may occur regardless of whether critical habitat is designated. The incremental costs associated with project modifications are discussed qualitatively in this chapter.
89. In the remainder of this Chapter, we first reiterate our methodology for isolating incremental costs described in Chapter 2. Next, we estimate the number of likely future consultations and consider associated incremental costs. Of the proposed Texas golden gladeceess critical habitat, Units 1, 3, and 4 are threatened by transportation-related activities and all units are threatened by utility-related activities. Additionally, the private land in all four units for the Texas golden gladeceess is expected to be targeted for land management projects by the Partners for Fish and Wildlife (PFW).
90. Of the proposed Neches River rose-mallow, Units 1 and 4 are threatened by transportation-related activities. Unit 4 is threatened by water management activities while the primary threat in Units 5 through 8 is land management activities within the

⁴⁷ U.S. Fish and Wildlife Service, Memorandum from Field Supervisor, Corpus Christi, Texas, Field Office to Industrial Economics, Inc., Cambridge, Massachusetts, "Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow," September 2, 12, 2012, p. 9.

Davy Crockett National Forest. Units 1 through 4 and 9 through 11 are threatened by utility-related activities.

4.1 METHODOLOGY FOR ISOLATING INCREMENTAL IMPACTS

91. To inform the economic analysis, the Service provided a memorandum describing its expected approach to conservation for the Texas golden gladeceess and Neches River rose-mallow following critical habitat designation. As discussed in Chapter 2, the Service's memorandum provides information on how the Service intends to address projects during section 7 consultation that might lead to adverse modification of critical habitat as distinct from projects that may jeopardize the species. The Service's memorandum is provided in Appendix B.
92. The Service concludes that "in proposed critical habitat [for the Neches River rose-mallow] it would be unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat and measures needed to avoid jeopardizing the species," largely because the "specific habitat requirement [is] closely tied to those habitat conditions"⁴⁸. That is, conservation measures implemented for the purposes of reducing impacts to designated critical habitat (i.e., adverse modification analysis) may not be distinguishable from those implemented to reduce impacts to the reproduction, numbers, or distribution of the species (i.e., jeopardy analysis). Thus, the designation of critical habitat for the Neches River rose-mallow is unlikely to result in direct incremental impacts beyond the additional administrative costs of considering adverse modification in a section 7 consultation because: (1) proposed projects affecting the habitat are also likely to affect the plant; (2) conservation measures to protect the plant and critical habitat are indistinguishable; and (3) the designation is unlikely to provide new information to stakeholders about the presence of the plant on or near their properties.
93. The Service concludes that the Texas golden gladeceess is also tied very closely to its habitat requirements, and although not always detectable, occupies all critical habitat units. The plant's small size and limited window of flowering and producing fruit make it difficult to find. Additionally, the species may not emerge in a given area during a given year because of drought conditions.⁴⁹ Thus, project proponents may not identify the plant at a given project site within proposed critical habitat, even though the unit is believed to be occupied.⁵⁰
94. Therefore, the designation of critical habitat for the Texas golden gladeceess may result in direct incremental impacts beyond the additional administrative costs of considering adverse modification in a section 7 consultation because: (1) only in cases where the plant

⁴⁸ U.S. Fish and Wildlife Service, Memorandum from Field Supervisor, Corpus Christi, Texas, Field Office to Industrial Economics, Inc., Cambridge, Massachusetts, "Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow," September 21, 2012. P. 4.

⁴⁹ U.S. Fish and Wildlife Service, Memorandum from Field Supervisor, Corpus Christi, Texas, Field Office to Industrial Economics, Inc., Cambridge, Massachusetts, "Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow," September 2, 2012, P. 9.

⁵⁰ Personal communication. Region 2 Senior Listing Biologist, US FWS. 10 31 2012.

can be found will proposed projects affecting the habitat also affect the plant; and (2) modifications to projects in designated critical habitat may be undertaken that would not have been carried out but for the critical habitat designation.⁵¹ Because we lack information about the probability that the plant will be found during site surveys, we conservatively assume that all costs of future section 7 consultations for the plant result incrementally from the designation of critical habitat.

95. Finally, landowners may face indirect impacts. Misinformation may influence public perception that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are likely. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory impacts associated with critical habitat, the impact of the designation on property markets may decrease. This type of critical habitat impact is not well studied in the economics literature.⁵² Thus, we are uncertain whether stigma effects will occur in response to this designation. Furthermore, the data required to measure such indirect effects are not readily available. Exhibit 4-1 provides a summary of the process for separating the incremental and baseline effects of the critical habitat designation for the two plant species.

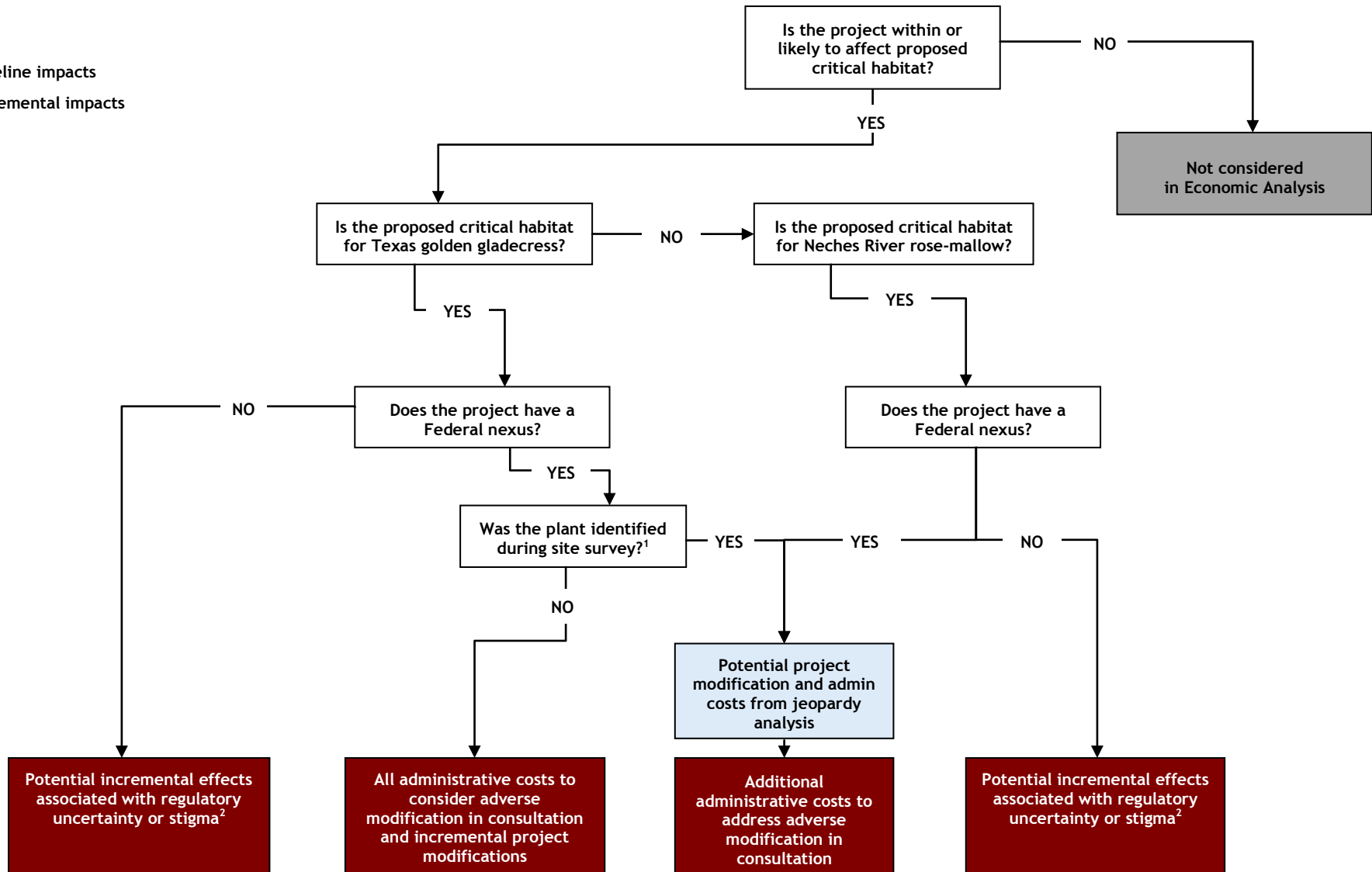
⁵¹ Personal communication. Region 2 Senior Listing Biologist, US FWS. 10 31 2012.

⁵² Several studies have attempted to estimate the impact of perceptions about the effect of critical habitat designation on land values and economic activity. Examples include Auffhammer, M., M. Oren, and D. Sunding. 2009. "Economic Impacts of Critical habitat Designation: Evidence from the Market for Vacant Land." Workshop Paper, The University of Arizona, Program on Economics, Law, and the Environment, available at <http://ele.arizona.edu/files/ELoSunding1-30-09.pdf> ; List, J.A., M. Margolis, and D. E. Osgood. 2006. "Is the Endangered Species Act Endangering Species?" National Bureau of Economic Research Working Paper Series, Working Paper 12777, available at <http://www.nber.org/papers/w12777>; and Lueck, Dean and Jeffrey A. Michael, April 2003, "Preemptive Habitat Destruction Under the Endangered Species Act," *Journal of Law and Economics*, 46: 27-60. While these studies provide evidence that landowners make land use decisions in response to listing and critical habitat regulations regardless of whether a section 7 nexus is present, none of the situations studied in these papers is directly applicable to this analysis.

EXHIBIT 4-1. FRAMEWORK FOR DETERMINING BASELINE AND INCREMENTAL IMPACT

Key:

 Baseline impacts

 Incremental impacts


Notes:

1. Because the probability of identifying the plant during a site survey is unknown, in this analysis we conservatively assume that the plant is never identified during surveys.

4.2 TRANSPORTATION-RELATED ACTIVITY IN CRITICAL HABITAT

96. In this section, we first discuss potential impacts to proposed critical habitat for the Texas golden gladeceess. Then, we undertake a similar analysis for the Neches River rose-mallow. Total costs are presented at the end of this chapter.

4.2.1 TEXAS GOLDEN GLADECRESS

97. Transportation ROWs exist in all four of the Texas golden gladeceess units. In total, approximately 1.6 percent of all the land in the four units is State- or county-owned in the form of ROWs.

- Unit 1 is bisected by State Highway (SH) 21, and approximately 2 percent of the land is State-owned and managed by TxDOT. The known gladeceess population in this Unit exists partially within this ROW.
- Unit 2 contains one ROW for Country Road 151 (managed by San Augustine County). Other than this road, all land in this unit is privately owned. The known gladeceess population exists immediately adjacent to the county road, but is thought to be limited to private land as the ROW is narrow.
- Approximately 8 percent of Unit 3 consists of county ROW, managed by TxDOT. The remaining 92 percent of the critical habitat in this unit is privately owned.
- Approximately 1 percent of Unit 4 is a State-owned ROW managed by TxDOT. The remaining 99 percent of the critical habitat in Unit 4 is privately owned.

98. Exhibit 4-2 illustrates the location of roadways in relation to the four critical habitat units for the Texas golden gladeceess.

99. Transportation projects likely to take place in the ROWs within the units include safety projects, such as minor shoulder widening or the addition of travel, passing, or turn lanes. Generally, these State directed projects are carried out with some contribution of Federal funds. For this reason, we assume all of these types of TxDOT projects will have a Federal nexus. General highway maintenance projects such as mowing are generally funded entirely by the State and thus are unlikely to have a Federal nexus. Furthermore, Federal funding is unlikely to be used for projects undertaken in the County Road ROW.

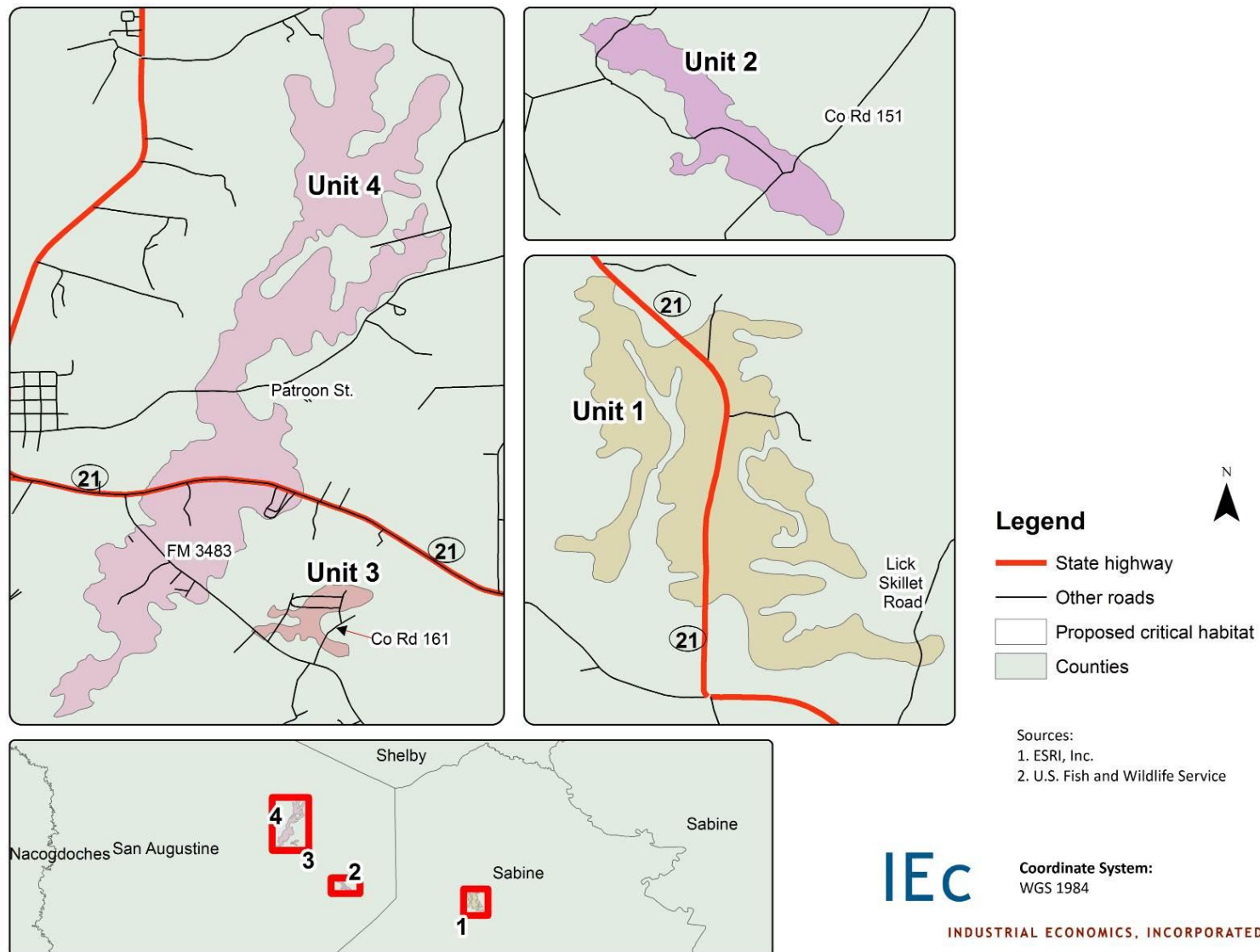
100. The frequency of roadway safety projects vary based on a variety of factors including: development and traffic patterns, safety incidents, type of road, and availability of funding.⁵³ While wide ranges of project frequency exist, we assume an average of one project every ten years on a given stretch of highway (regardless of a Federal nexus).⁵⁴ Thus, in total, we assume two projects for each Unit containing a TxDOT managed ROW over the 20 year timeframe of the analysis. The only major roadway projects TxDOT foresees involving Federal funding within the next 20 years in the proposed critical

⁵³ Personal communication. Jennifer Adams, TxDOT. November 2012; Personal communication. Jay Tullios, TxDOT. November 2012.

⁵⁴ Ibid.

habitat designation are safety projects. Because the consultations would occur without the designation of critical habitat, we assume consultation costs are limited to the additional administrative effort required to document consideration of the adverse modification standard.

EXHIBIT 4-2. TEXAS GOLDEN GLADECRESS PROPOSED CRITICAL HABITAT AND AREA ROADS



101. Whether consultation for transportation projects advances as formal or informal depends on a variety of factors, including project type, project timeline, and plant survey results. In the past, TxDOT has worked closely with the Service when considering projects where species of concern may be located. We assume that some of the projects will result in informal section 7 consultations and that through this process, the project design and conservation actions will be structured such that all adverse effects would be preemptively avoided. However, there is the potential that adverse effects cannot be avoided and formal consultation is needed. Based on TxDOT's estimation, we assume half of the consultations will be formal and the other half will be informal.⁵⁵
102. Three Texas golden glade cress units (Units 1, 3, and 4) contain State-managed ROWs. Unit 2 is managed by the County and does not receive federal funds. As stated above, we assume one project every ten years on a given stretch of highway. Each of the three critical habitat units contain a separate stretch of highway; therefore, a total of six TxDOT projects are likely to occur over the next 20 years, resulting in three formal and three informal section 7 consultations. Because we conservatively assume that the plant will not be found during pre-project surveys, the entire administrative cost of a consultation is assumed to result incrementally from the designation of critical habitat. The aggregate incremental administrative cost of these consultations is \$66,000, including \$18,000 of costs incurred by the Service, \$21,000 incurred by USDOT, and \$28,000 incurred by the TxDOT, over a 20 year period.⁵⁶ We assume that these transportation projects have an equal probability of occurring at any time during the study's timeframe. These estimates are also considered conservative because we assume that all projects occur independently; that is, we assume USDOT initiates separate consultations for each project.
103. TxDOT also notes that costs may arise from more complex consultations and the development of several project proposals and designs resulting from the critical habitat designation.⁵⁷ We assume that the incremental administrative costs estimated above to consider adverse habitat modification during consultation include the additional time associated with engaging in these more complex consultations. Because we conservatively assume that the Texas golden glade cress is never identified during plant surveys, all consultations for this plant are considered incremental due to critical habitat in this analysis.
104. TxDOT also notes that costs may arise from the development of additional plan proposals of engineering solutions resulting from critical habitat designation⁵⁸. TxDOT was unable to provide more specific information about possible engineering solutions. Thus, we refer to experience with other species for more information.

⁵⁵ Ibid.

⁵⁶ Total may not sum due to rounding.

⁵⁷ Personal communication. Jennifer Adams, TxDOT. November 2012; Personal communication. Jay Tullios, TxDOT. November 2012.

⁵⁸ Ibid.

105. For a recent safety project widening the shoulder on SH 21, TxDOT formally consulted with the Service due to the presence of white bladderpod, a federally-listed species that shares many habitat characteristics with the Texas golden gladeceess. In the course of the consultation, the shoulders, originally planned to be 10 feet wide were reduced in width to 4 feet. The incremental cost of this project modification is equivalent to the reduced safety benefits provided by the wider shoulder, net of the reduced shoulder-widening costs. To determine this number, we would need to know the increased probability of safety incidents given the narrower shoulder as well as a value for each incident (either a cost for treatment or a willingness-to-pay to avoid the injury and damage). This information is not readily available. Therefore, while we recognize this category of incremental project modification costs, we are unable to quantify these costs at this time.

4.2.2 NECHES RIVER ROSE-MALLOW

106. Transportation ROWs are present in Units 1 and 4 of the proposed critical habitat for the Neches River rose-mallow.
- Approximately one-third of Unit 1 consists of a TxDOT owned ROW for Hwy 94.
 - Unit 4 is a 6.2 acre parcel of occupied habitat and is entirely State-owned. This habitat is located along Hwy 204 ROW and within the Mud Creek basin.
107. When calculating the potential administrative costs of consultations in these units, we apply the same assumptions regarding the likelihood of a Federal nexus, frequency of consultations, and whether the consultations are likely to be informal or formal as for the Texas golden gladeceess.⁵⁹ With 2 units containing state-managed ROWs, we assume 4 TxDOT projects are likely to occur over the next 20 years, two requiring formal consultation and two requiring informal consultation with the Service. In this case, because the consultations would occur absent the designation of critical habitat, we assume consultation costs are limited to the additional administrative effort required to document consideration of the adverse modification standard. Incremental project modifications are unlikely.
108. The aggregate incremental cost is \$15,000, including \$4,000 of costs incurred by the Service, \$4,700 incurred by the U.S. Department of Transportation, and \$6,200 incurred by the Texas Department of Transportation.⁶⁰ We assume that these projects have an equal probability of occurring any time over the 20 year timeframe of this study. As with the Texas golden gladeceess, these estimates are also considered conservative because they assume that all projects occur independently; that is, USDOT would not initiate consultation on more than one project at a time.

4.3 LAND MANAGEMENT IN CRITICAL HABITAT

⁵⁹ Ibid.

⁶⁰ Totals may not sum due to rounding.

109. As illustrated in Exhibits 1-1 and 1-2, much of the land within the designated critical habitat for both Texas golden gladeceess and Neches River rose-mallow is privately owned. Within East Texas, the Service's Partners for Fish and Wildlife (PFW) works with landowners to restore, improve and protect wildlife habitat on privately-held lands. These benefits are achieved largely through technical assistance for land management planning and activities.
110. Following promulgation of the final rule, PFW projects are expected to occur on private lands with willing landowners in critical habitat areas for the Texas golden gladeceess. At this time, no PFW projects are anticipated in the designated critical habitat for the Neches River rose-mallow.⁶¹ Costs of PFW activities and the associated intra-service section 7 consultations for Texas golden gladeceess are considered incremental since projects may occur without the documented presence of the plant.
111. The first restoration and/or enhancement pilot project would be expected to be complete within three years following the rule-making as long as adequate funding is provided to undertake the project activities. Approximately 80 percent of the estimated 15 private landowners holding land within the proposed critical habitat for Texas golden gladeceess are projected to engage in a PFW land management project within 20 years following the rule-making. Because PFW projects may occur simultaneously, we conservatively estimate that the intra-service section 7 consultation and the activity costs associated with each project are incurred in 2016.
112. All willing landowners would be provided technical assistance to restore or enhance altered Weches glade habitat capable of supporting the Texas golden gladeceess. Initial project activities may include herbicide stem and broadcast treatments, controlled burns and fencing. Such actions reduce recognized threats to the Texas golden gladeceess, including lack of fire, invasive woody species encroachment and cattle grazing. Maintenance activities include controlled burns every two to three years and follow-up spot herbicide individual plant treatment (IPT).
113. Recognizing that every project will most likely be different and that the proposed critical habitat designation does not necessarily follow property lines, we assume that eighty percent of the private land within critical habitat will experience initial and follow-up restoration and/or enhancement activities.⁶² We assume initial activities of three herbicide stem and broadcast treatments and one controlled burn. A maintenance burn is assumed to occur every three years following the initial project. These costs may be even higher if fencing and additional herbicide treatments are needed.
114. The aggregate incremental costs of (a) 12 new informal consultations considering adverse modifications only, and (b) project expenses including initial and maintenance phases for the Texas golden gladeceess over the 20 year timeframe of this analysis are \$580,000

⁶¹ Personal communication. Private Lands Biologist. PFW. February 2013.

⁶² We note that this assumption allows us to translate number of property owners to number of acres given the absence of this information; however, this assumption may not be valid if land holding vary significantly among the landowners.

(undiscounted), including \$22,000 incurred by the Service's section 7 consulting biologists and \$558,000 incurred by PFW.⁶³

4.4 FOREST MANAGEMENT IN CRITICAL HABITAT

115. Neches River rose-mallow critical habitat Units 5 through 8 are all occupied units located within the Davy Crockett National Forest. Each of these units contains the physical and biological features essential to the conservation of the species and is located in an area managed as wetlands, riparian zones, or streamside areas. In one unit, the Neches River rose-mallow is found near an ephemeral flatwoods pond; in the other three units, the plant is located near a year-round lake.⁶⁴
116. As mentioned in Chapter 3, the land in the Davy Crockett National Forest is managed according to the Land and Resources Management Plan (LRMP) adopted in 1996. As discussed in Chapter 3, the LRMP for the Davy Crockett National Forest includes protective measures for the Neches River rose-mallow. Revisions to this plan are expected to occur in either 2014 or 2015. The revised plan is anticipated to increase the protection for the Neches River rose-mallow; however prior to the adoption of the revised management plan, we assume that USFS will engage in an informal section 7 consultation with the Service. We conservatively assume that the informal consultation will occur in 2014. We further assume that the cost of this consultation will be distributed equally between the four critical habitat units that will be affected. The incremental administrative cost of considering critical habitat during this consultation is \$1,900, including \$610 of costs incurred by the Service and \$1,300 incurred by the USFS.⁶⁵
117. Additional land management activities described in the LRMP that may potential adversely affect the habitat of the Neches River rose-mallow include application of herbicide and prescribed burns for vegetation control. From discussions with the USFS, these activities are not anticipated to adversely impact critical habitat. Herbicide permitted for treatment of invasive species must be used locally and must be labeled for aquatic use when applied in the designated critical habitat for the Neches River rose-mallow. Prescribed fire is not expected to be used within the proposed critical habitat for the plant.
118. Thus, we do not expect any section 7 consultation, either formal or informal, to arise as a consequence of these actions.
119. The Texas golden gladeceess does not occur within USFS lands. Therefore, we do not anticipate any section 7 consultations for this species with the USFS.

⁶³ Adverse modification to the critical habitat is very unlikely since the primary purpose of these projects is to provide improved habitat for the Texas golden gladeceess.

⁶⁴ Personal communication. Thomas Philipps, USFS. November 2012.

⁶⁵ Totals may not sum due to rounding.

4.5 WATER MANAGEMENT IN CRITICAL HABITAT

120. The Neches River rose-mallow is a wetland species. Changes to the hydrology of its habitat could negatively impact the species. Examples of hydrology-altering activities include channelization projects that alter natural flow regimes and water diversion projects. We identified one water project that may result in a section 7 consultation.
121. In 1978, the Angelina and Neches River Authority (ANRA) proposed the construction of a reservoir known as Lake Columbia in Cherokee and Smith Counties, Texas for the purpose of municipal and industrial water supply. To create the reservoir, a dam would be constructed on Mud Creek, impounding approximately 195,500 acre-feet of water and diverting water from the downstream flow of Mud Creek. Critical habitat Unit 4 contains 8.7 acres of occupied habitat and is located downstream from the proposed reservoir. An essential biological feature of Unit 4 is its location within the Mud Creek basin. Therefore, decreased water flows following the construction of the reservoir may alter the hydrology and habitat suitability for the Neches River rose-mallow at this site.
122. Because the reservoir construction project is subject to permitting requirements by the Corps, we assume that the Corps will have to undertake a formal consultation with the Service prior to beginning reservoir construction and conservatively assign these costs to 2013. The incremental administrative cost of considering critical habitat during this consultation is \$5,000, including \$1,400 of costs incurred by the Service, \$1,600 incurred by the U.S. Army Corps of Engineers, and \$2,080 incurred by ANRA.⁶⁶ The Corps does not anticipate any other future section 7 consultations for the Neches River rose-mallow within the timeframe of this analysis.⁶⁷
123. The Texas golden gladeecress does not appear to occur in wetland areas and water management is not identified as a threat to the species. Therefore, we do not anticipate that the Corps will undertake section 7 consultations in the gladeecress units.

4.6 UTILITIES-RELATED ACTIVITY IN CRITICAL HABITAT

124. The proposed critical habitat designation for the Texas golden gladeecress falls within the region served by the Deep East Texas Electric Cooperative (DETEC). The utilities project work undertaken by this cooperative is reimbursed by USDA's RUS. Two similarly RUS-funded electric cooperatives serve the area in which the proposed critical habitat units for the Neches River rose-mallow are located: Houston County Electric Cooperative (HCEC) and Rusk County Electric Cooperative (RCEC).
125. Each electric cooperative develops a comprehensive work plan approximately every four years that details the project work anticipated over the four year timeframe. Environmental reports are currently drafted with each work plan and submitted to the several federal agencies, including the Service. To date, no environmental report produced by these cooperatives has progressed to a section 7 consultation with the Service.⁶⁸ Following promulgation of the final rule, however, the Service anticipates

⁶⁶ Totals may not sum due to rounding.

⁶⁷ Personal communication. Jennifer Walker, Chief, Permits Section Regulatory Branch, USACE. November 2012.

⁶⁸ Personal communication. General Field Representative, RUS. February 2013.

requesting plant surveys and potentially project modifications under an informal section 7 consultation for activities in the critical habitat designations for both the Texas golden gladeceess and the Neches River rose-mallow.⁶⁹

126. Avoidance of impacts within critical habitat from utility-related activities is expected to be easily achievable. The cooperatives primarily work with existing power lines and major excavations associated with burying lines is not anticipated in the rural areas of the critical habitat. Potential project modifications proposed by the Service include modifying clearing and maintenance techniques around existing utility poles and moving new pole placement to avoid digging into glade substrate.⁷⁰ Costs associated with these project modifications are expected to be very minor and are not quantified in this analysis.
127. Based on the locations of activities described in past work plans, we anticipate that each work plan for each cooperative will include one project occurring in critical habitat. We conservatively assume that the costs will be incurred in the publication year of the work plan. We further assume that, apart from the four Neches River rose-mallow units located within the national forest, there is an equal probability of a utility-related project occurring in each critical habitat unit. Thus, we distribute costs equally among these units.
128. Because all Neches River rose-mallow critical habitat units are considered occupied and the plant is readily identifiable, we assume that a survey for a project occurring within Neches River rose-mallow critical habitat will detect the plant. Following such a positive identification, we anticipate that an informal section 7 consultation will be undertaken. Because of the documented presence of the plant, this consultation would be expected to occur regardless of the presence of critical habitat. Incremental costs associated with these consultations are those administrative costs stemming from the consideration of adverse modifications to critical habitat.
129. The aggregate incremental administrative cost of considering Neches River rose-mallow critical habitat during the ten informal consultations expected to occur as a result of planned utility-related activities is \$24,000, including \$6,100 of costs incurred by the Service, \$7,800 incurred by RUS and \$10,100 incurred by the two electric cooperatives serving the area in which the designated critical habitat is located.
130. As described previously, because of the difficulties in identifying the Texas golden gladeceess, we conservatively assume that, although all of the units are considered occupied, the plant is not found during surveys. The Service anticipates recommending project modifications through an informal section 7 consultation, which would not occur absent the critical habitat designation. Therefore, incremental costs for utility-related activity in proposed critical habitat for the Texas golden gladeceess include: (a) administrative costs for new section 7 consultations that consider adverse modifications to critical habitat only and (b) costs associated with project modifications proposed

⁶⁹ Personal communication. Project Leader. US FWS. February 2013.

⁷⁰ Ibid.

during the consultation. As stated above, we expect this latter category of costs to be very minor and do not quantify these costs in this report.

131. The aggregate incremental administrative cost of the estimated five new informal consultations considering only adverse modification for Texas golden gladeceess is \$36,000, including \$9,200 of costs incurred by the Service, \$12,000 incurred by RUS, and \$15,200 incurred by the electrical cooperative serving the region.⁷¹

4.7 ACTIVITIES NOT EXPECTED TO OCCUR IN CRITICAL HABITAT

132. The Service identified several classes of activities that we do not believe will occur within the 20 year timeframe of this analysis and thus will not result in a section 7 consultation. As presented in Chapter 3, the USDA's National Resource Conservation Service provides technical assistance for land management activities, including poultry and pine tree operations in the area of the proposed critical habitat designation. Areas most likely to be affected include all four units for Texas golden gladeceess and Units 1 through 4 and 9 through 11 for the Neches River rose-mallow. However, NRCS predicts that involvement in projects within the critical habitat designation within the timeframe of this study is unlikely.⁷²
133. Units for both the Texas golden gladeceess and the Neches River rose-mallow include ROWs for pipeline construction. Oil pipelines crossing interstate borders are subject to Federal regulation, creating a Federal nexus for section 7 consultation under the Act. Based on discussion with the two agencies managing land on which there are pipeline ROWs, TxDOT and the USFS, no pipeline construction within the proposed critical habitat is expected in the next twenty years. Furthermore, the Neches River rose-mallow in the Davy Crockett National Forest occurs in riparian and wetland areas, lands generally avoided during pipeline construction.

4.8 CONCLUSIONS

134. Total potential incremental costs of the designation are provided in Exhibit 4-3. Due to the existing baseline protections already afforded the Neches River rose-mallow, incremental costs of critical habitat designation for this species are likely limited to the additional administrative cost of considering adverse modification during section 7 consultations. These costs may range from \$29,000 to \$37,000, in present value terms, depending on whether a three percent or seven percent discount rate is applied. On an annualized basis, costs may range from \$2,400 to \$2,500.
135. Despite the existing baseline protections already afforded the Texas golden gladeceess, the challenges of detecting this plant within the designated critical habitat due to its natural history may result in incremental conservation measures due entirely to the existence of critical habitat. Conservatively, we assume that the plant is never detected, and all administrative costs associated with consultations considering adverse

⁷¹ Totals may not sum due to rounding.

⁷² Personal communication. Janet Ritter, District Conservationist, Natural Resource Conservation Service. November 2012.

modification as well as expected project modifications and project costs are incremental effects of the designation. In reality some of these costs may occur regardless of whether critical habitat is designated. Administrative and project costs resulting from the designation of critical habitat for the gladeceess could range from \$478,000 to \$577,000, in present value terms, depending on whether a three percent or seven percent discount rate is applied. On an annualized basis, these costs may range from \$37,000 to \$42,700. Incremental project modification costs may include the increased safety risk associated with narrower road shoulders and the cost of changing maintenance of utility poles and altering placement of new utility poles; however, we are unable to quantify these costs at this time.

EXHIBIT 4-3. TOTAL ESTIMATED INCREMENTAL IMPACTS BY UNIT AND BY SPECIES (\$2012)

SPECIES	UNIT	UNDISCOUNTED COST	PRESENT VALUE		ANNUALIZED VALUE ¹	
			3 PERCENT	7 PERCENT	3 PERCENT	7 PERCENT
Neches River rose-mallow	1: Highway 94 ROW	\$11,000	\$8,300	\$6,100	\$540	\$540
	2: Harrison County	\$3,400	\$2,600	\$1,900	\$170	\$170
	3: Lovelady	\$3,400	\$2,600	\$1,900	\$170	\$170
	4: Highway 204 ROW	\$16,000	\$13,000	\$11,000	\$870	\$980
	5: Davy Crockett NF, compartment 55	\$470	\$460	\$440	\$30	\$39
	6: Davy Crockett NF, compartment 11	\$470	\$460	\$440	\$30	\$39
	7: Davy Crockett NF, compartment 20	\$470	\$460	\$440	\$30	\$39
	8: Davy Crockett NF, compartment 16	\$470	\$460	\$440	\$30	\$39
	9: Champion	\$3,400	\$2,600	\$1,900	\$170	\$170
	10: Mill Creek Gardens	\$3,400	\$2,600	\$1,900	\$170	\$170
	11: Camp Olympia	\$3,400	\$2,600	\$1,900	\$170	\$170
Texas golden gladeecress	1: Geneva	\$190,000	\$160,000	\$130,000	\$10,000	\$12,000
	2: Chapel Hill	\$77,000	\$66,000	\$55,000	\$4,300	\$4,800
	3: Southeast Caney Creek Glades	\$51,000	\$41,000	\$33,000	\$2,700	\$2,900
	4: Northwest Caney Creek Glades	\$370,000	\$310,000	\$260,000	\$20,000	\$23,000
	TOTAL		\$610,000	\$510,000	\$40,000	\$45,000

Source: IEc calculations.

Notes:

- (1) Present value impacts are annualized over the period of analysis, 2013 through 2032, or 20 years.
- (2) For the costs incurred due to consultations with USDOT/Texas Department of Transportation, the costs are distributed evenly over the 20 year period reflecting the fact that two consultations are expected to take place at some point over the next 20 years.
- (3) The incremental costs for the information consultation anticipated for the revision of the Land and Resource Management Plan are divided equally by the four NF Units affected by this activity. Additionally, while these costs do include biological assessment, they do not include third party participation.
- (4) Incremental costs associated with utility activities are divided equally between the appropriate units since the precise locations of future activities are unknown; incremental costs associated with PFW projects are distributed among the units based on number of private landowners within each Unit.
- (5) Totals may not sum due to rounding.

CHAPTER 5 | ECONOMIC BENEFITS OF CRITICAL HABITAT DESIGNATION

- 137 The prior chapters of this report describe the types of conservation efforts likely to be undertaken as a result of the listings of the Texas golden gladeceess and the Neches River rose-mallow under the Act (baseline) and the designation of critical habitat for these two species (incremental). In this chapter, we discuss the potential benefits resulting from the critical habitat designation.
- 138 The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as Texas golden gladeceess and Neches River rose-mallow. Various economic benefits, measured in terms of social welfare or regional economic performance, may result from critical habitat designation. The benefits can be placed into two broad categories: (1) those associated with the primary goal of species conservation (i.e., direct benefits) and (2) those additional beneficial services that derive from the conservation efforts but are not the purpose of the Act (i.e., ancillary benefits). The public's willingness to pay to achieve the conservation benefits to Texas golden gladeceess and Neches River rose-mallow resulting from their critical habitat designations represents the monetary estimates of the benefits of the proposed critical habitat designation.
- 139 Quantification and monetization of species conservation benefits requires information on the incremental change in the conservation probability of either Texas golden gladeceess or Neches River rose-mallow expected to result from the critical habitat designation. As described in Chapters 3 and 4, for the Neches River rose-mallow, modifications to future projects are unlikely beyond the baseline given that the measures needed to avoid the destruction or adverse modification of critical habitat will also be needed to avoid jeopardizing the species. Thus, in this instance, critical habitat designation likely will add minimal incremental conservation benefits to those already provided by baseline conservation actions.
- 140 Modest modifications to future transportation projects may result from the designation of critical habitat for the Texas golden gladeceess. However, while the designation may influence the probability that this plant species will be conserved, the published valuation literature does not support monetization of such changes for this species.⁷³

⁷³ Numerous published studies estimate individuals' willingness to pay to protect endangered species. The economic values reported in these studies reflect various groupings of benefit categories (including both use and non-use values). For example, these studies assess public willingness to pay for wildlife-viewing opportunities, for the option for seeing or experiencing the species in the future, to assure that the species will exist for future generations, and to simply know a species exists, among other values. Unfortunately, this literature addresses a relatively narrow range of species and circumstances compared to the hundreds of species and habitats that are the focus of the Act. Specifically, existing studies focus almost exclusively on large mammal, bird, and fish species, and generally do not report values for incremental

- 141 Other benefits may also be achieved through designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness to pay for conservation of a specific species. Studies have been done that estimate the public's willingness to pay to preserve wilderness areas, for wildlife management and preservation programs, and for wildlife protection in general. These studies address categories of benefits (e.g., ecosystem integrity) that may be similar to the types of benefits provided by critical habitat, but do not provide values that can be used to establish the incremental values associated with this proposed critical habitat designation (i.e., the ecosystem and species protection measures considered in these studies are too dissimilar from the habitat protection benefits that may be afforded by this designation).
- 142 Again, because the designation of critical habitat for Neches River rose-mallow is unlikely to preserve new areas or protect wildlife above existing baseline protections, in this instance, critical habitat likely will add minimal incremental benefits to those already provided by baseline actions. For the Texas golden gladeceess, there may be incremental benefits of this type due to modifications of transportation projects. Road safety and maintenance projects that result in less roadside disturbance may improve these natural road edge areas. Because of the small scale and specific nature of these potential incremental benefits, we are unable to quantify them at this time.
- 143 Similarly, economists have conducted research on the economic value of ancillary benefits, such as the preservation of open space, which may positively affect the value of neighboring parcels, or maintenance of natural hydrologic functions of an ecosystem, which result in improved downstream water quality. For the Neches River rose-mallow, measureable ancillary benefits are unlikely given that no incremental changes in behavior to protect such resource are anticipated to result from the designation. For the Texas golden gladeceess, ancillary benefits may occur where protective measures are taken due entirely to the critical habitat designation; however, these benefits are projected to be small and impractical to quantify.

changes in species conservation. Importantly for this analysis, no studies estimate the value the public places on preserving a plant species.

REFERENCES

5 U.S.C. §§601 *et seq.*

2 U.S.C. §§1531 *et seq.*

16 U.S.C. 1532.

16 U.S.C. 1538(a)(2).

16 U.S.C. §1533(b)(2).

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APPENDIX A | ADDITIONAL STATUTORY REQUIREMENTS

144 This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the RFA as amended by the SBREFA. Information for this analysis was gathered from the Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted in the development of the economic analysis. Section A.2 addresses Title II of UMRA, which requires agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Section A.3 is included pursuant to Executive Order 12630, which requires agencies to adhere to certain principals in rulemakings that have takings implications. Finally, the energy analysis in Section A.4 is conducted pursuant to Executive Order No. 13211.

145 The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule. The baseline impacts associated with the listing of the Texas golden gladeceess and the Neches River rose-mallow and other Federal, State, and local regulations and policies, as discussed in Chapter 3 of this report, are expected to occur regardless of the outcome of this rulemaking.

A.1 POTENTIAL IMPACTS TO SMALL ENTITIES

146 When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).⁷⁴ No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for Texas golden gladeceess and Neches River rose-mallow critical habitat designation to affect small entities.

147 To ensure broad consideration of impacts on small entities, the Service has prepared this screening analysis without first making the threshold determination in the proposed rule

⁷⁴ 5 U.S.C. § 601 et seq.

regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This screening analysis will therefore inform the Service's threshold determination.

- 148 This screening analysis is based on the estimated incremental impacts associated with the proposed rulemaking. Potential baseline and incremental impacts depend on the existence of conservation efforts and the existence of a Federal nexus. In the case of Texas golden glade, the impacts also depend on the presence of the species. This analysis uses the methodology outlined in Exhibit 4-1 to distinguish between baseline and incremental impacts.
- 149 For the Neches River rose-mallow, the incremental costs of this designation are limited to the administrative costs of considering adverse modification during section 7 consultation. As described in Chapter 4, we anticipate that sixteen such consultations will occur. The Service and the Federal action agencies (USDOT, USFS, RUS and the Corps), are not small entities. TxDOT, the third party participant in four of these consultations, is not a small entity. For ten of these consultations, the third party participant is an electric cooperative. Electric cooperatives may be considered independently owned and operated establishments that are not dominant in their field, thus falling under protection of the RFA. As calculated in this analysis, however, the costs to these entities are *de minimis* and would not be expected to have significant impact.
- 150 For the Texas golden glade, the incremental costs of this designation are both the administrative costs of considering adverse modification during section 7 consultation, the costs of any recommended project modifications and the costs of new land management projects occurring as a result of the critical habitat designation. We project that twenty-three consultations will occur. As is the case with the Neches River rose-mallow, the Service, RUS, USDOT and TxDOT are not small entities. For five of the consultations, two electric cooperatives serve as third party participants. As concluded above for the Neches River rose-mallow, the costs anticipated to be incurred by these entities are *de minimis* (less than \$1,000 annually) and would not be projected to result in significant impacts.
- 151 In conclusion, while two small electric cooperatives are anticipated to incur costs as a result of the designation of critical habitat for Texas golden glade and Neches River rose-mallow, the costs are not expected to result in significant impacts to these entities.

A.2 POTENTIAL IMPACTS TO GOVERNMENTS

- 152 Title II of UMRA requires agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector.⁷⁵ Under Section 202 of UMRA, the Service must prepare a written statement, including a cost-benefit analysis, for rules that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year. If a written statement is needed, Section 205 of UMRA requires the Service to identify and consider a

⁷⁵ 2 U.S.C. 1531 et seq.

reasonable number of regulatory alternatives. The Service must adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule, unless the Secretary publishes an explanation of why that alternative was not adopted. The provisions of Section 205 do not apply when they are inconsistent with applicable law.

- 153 As stated in the Proposed Rule, “the designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency”⁷⁶ Therefore, this rule does not place an enforceable duty upon State, local, or Tribal governments, or the private sector.

A.3 TAKINGS

- 154 Executive Order 12630, “Governmental Actions and Interference with Constitutionally Protected Property Rights,” issued March 15, 1988, requires agencies to adhere to certain principals in rulemakings that have takings implications and provide certain information to OMB for any actions with identified takings implications. Section 2(a) of the Executive Order defines takings implications to include any “regulations that propose or implement licensing, permitting, or other requirements or limitations on private property use, or that require dedications or exactions from owners of private property.”

- 155 As described in Chapter 2, the incremental effects of the proposed designation are largely limited to additional administrative costs of consultation. Activities taking place on private property are not likely to be affected. Thus, the proposed rulemaking is unlikely to have takings implications.

A.4 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

- 156 Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”⁷⁷

⁷⁶ U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Endangered Status for Six West Texas Aquatic Invertebrate Species and Designation of Critical Habitat; Proposed Rule. 77 FR 49637. August 16, 2012.

⁷⁷ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

- 157 The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
 - Reductions in fuel production in excess of 4,000 barrels per day;
 - Reductions in coal production in excess of 5 million tons per year;
 - Reductions in natural gas production in excess of 25 million Mcf per year;
 - Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
 - Increases in energy use required by the regulatory action that exceed the thresholds above;
 - Increases in the cost of energy production in excess of one percent;
 - Increases in the cost of energy distribution in excess of one percent; or
 - Other similarly adverse outcomes.⁷⁸
- 158 For the Neches River rose-mallow and the Texas golden glade, minimal modifications to future energy-related economic activities are anticipated to result from the designation of critical habitat. For both plant species, electric cooperatives are expected to modify utility-related activities and undergo section 7 consultations as a result of the critical habitat designation. . However, the administrative compliance costs and project modification costs expected to be incurred by electric cooperatives are sufficiently small (less than \$1,000 on an annualized basis) that they would not be anticipated to affect the cost of energy distribution. Thus, energy-related impacts are expected to be minimal.

⁷⁸ Ibid.

**APPENDIX B | INCREMENTAL MEMORANDUM PROVIDED BY THE SERVICE
(SEPTEMBER 21, 2012)**

**Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for Texas golden gladeceess and Neches River rose-mallow
September 21, 2012**

Introduction

The purpose of this memorandum is to provide information to serve as a basis for conducting an economic analysis of the proposed critical habitat for the *Leavemvorthia texana* (Texas golden gladeceess) and *Hibiscus dasycalyx* (Neches River rose-mallow). These species will be referred to by their common names throughout the remainder of this memo.

Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Service can exclude areas from critical habitat if it determines that the benefits of exclusion outweigh the benefits of including the areas as critical habitat, unless the exclusion will result in the species' extinction. In order to support its process of weighing benefits of excluding versus including areas as critical habitat, the Service prepares an economic analysis for each proposed critical habitat rule that describes and monetizes, where possible, the economic impacts (costs and benefits) of the proposed regulation.

Determining the economic impacts of critical habitat designation involves evaluating the "without critical habitat" baseline versus the "with critical habitat" scenario. The increment, or the difference, between these two scenarios equals the impact of the designation. Measured differences between the baseline (world without critical habitat) and the designated critical habitat (world with critical habitat) can include (but are not limited to) changes in land or resource use, environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action agencies, and in some instances, State and local governments or private third parties. These are the "incremental effects" that serve as the basis for the economic analysis.

There are numerous ways that critical habitat designation can influence activities, but one of the important functions of this memorandum is to provide detailed information about the differences between actions required to avoid jeopardy versus actions that may be required to avoid adverse modification. The Service is in the process of updating the regulatory definition of adverse modification since it was invalidated by a prior court ruling. In the interim, we are relying on guidance in the Director's December 9, 2004, Memorandum, *Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act*. This memorandum explains that the conclusion for a section 7 analysis of a Federal action is to determine if the "critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role of the species ... " (p. 3). The information provided below is intended to identify the possible differences for these species under the different section 7 standards of jeopardy versus adverse modification.

Background

In total, we are proposing approximately 1,353 acres (ac) (539 hectares (ha) in four units as Texas golden gladeceess critical habitat; and approximately 188 ac (76 ha) in 11 units as Neches River rose-mallow critical habitat, all within seven counties in East Texas. For Texas golden gladeceess, the proposed critical habitat designation includes lands under State (2 percent) and private (98 percent) land ownership. For the Neches River rose-mallow, the proposed critical habitat designation includes

lands under Federal (25 percent), State (6 percent), and private (69 percent) land ownership. All of the proposed units for both species are occupied at the time of listing. Threats identified in the proposed rule for Texas golden gladeceess include quarrying of glauconite, natural gas and oil exploration and production activities, encroachment of nonnative and native woody and weedy vegetation, conversion of remaining glades and outcrops to pine tree plantations, and certain herbicide applications. For the Neches River rose-mallow identified threats include encroachment of nonnative and native woody species, herbicide applications, and alteration of water flow patterns or amounts, due to channelization, dredging, stream diversions, impoundments, levee installations, and ground water withdrawals.

As described in the proposed rule, the intended conservation role of critical habitat for Texas golden gladeceess and the Neches River rose-mallow is the protection of all existing population sites, as well as the potential to expand existing populations and support additional populations (for Texas golden gladeceess); the maintenance of ecological functions within these sites, including connectivity within and between sites in close geographic proximity to one another; and keeping these areas free of major habitat disturbing activities.

Baseline Analysis

The following discussion describes the regulatory circumstances that are anticipated without critical habitat designated for either species. These species are being proposed for listing concurrently with the proposed critical habitat designation, therefore, they have no prior section 7 consultation history. In the baseline scenario, section 7 of the Act requires that Federal agencies consult with the Service to ensure that any action that they authorize, fund, or carry out will not likely jeopardize the continued existence of the species.

For actions located on Federal lands, or subject to consultation through a Federal nexus or action (*e.g.* Federal funds), a jeopardy analysis for these species would look at the magnitude of a project's impacts relevant to the population(s) across the species' entire range. Furthermore, the jeopardy analysis would focus on effects to the species' reproduction, numbers, or distribution.

In contrast, an adverse modification analysis would focus on a project's impacts to the physical features (primary constituent elements), or other habitat characteristics in areas determined by the Secretary to be essential for the conservation of the species, and analyze impacts to the capability of the critical habitat unit to maintain its conservation role and function for survival and recovery of the species.

For Texas golden gladeceess' proposed critical habitat, proposed actions that would adversely affect the Primary Constituent Elements (PCEs) would, in those cases where the PCE's directly underlie the populations and their immediate surroundings, also likely constitute jeopardy to the species. For example, land activities that disturb or alter the natural vegetation community or the underlying geology supporting the species to the extent that the critical habitat would be adversely modified, would also result in the decline or loss of most, or even all, of Texas golden gladeceess plants due to the small areal extent of their populations. Examples of these types of activities include removal of plant cover, soil, and underlying geology; construction of well pads, buildings, or roads atop or directly upslope of population sites; application of herbicides that kill above ground plants and/or seedlings; plantings of pine trees in close proximity to small glade habitats that results in shading and accumulation of leaf litter; and land use practices that directly or indirectly encourage overgrowth by

nonnative and native woody species. As such, project modifications that minimize effects to Texas golden glade (e.g. avoiding excavation or construction upon or upslope of population sites; avoiding introduction of nonnative plants into glade sites; practicing active management to remove woody vegetation that is encroaching into glades; signage and fencing to exclude vehicle access; using caution with pesticides in the immediate area of occupied habitat; and staying far enough away from glades with pine tree plantings in order that mature trees do not shade, or contribute leaf litter to, the glade habitats) would also minimize effects to the PCEs associated with the glade's proposed critical habitat.

For the Neches River rose-mallow's proposed critical habitat, proposed actions that would adversely affect PCEs would also likely negatively impact the species. Examples of land activities that would by themselves, or in conjunction with other land activities, disturb or alter the vegetation community, underlying substrate, and hydrology to the extent that Neches River rose-mallow's critical habitat would be adversely modified would usually result in the decline or loss of the plants themselves. Examples of these types of activities include channelization projects that alter natural flow regimes, changes to site hydrology due to water diversions from streams and rivers, allowing nonnative and native woody riparian species to encroach into occupied sites, grazing during times of drought stress, detrimental roadside management practices including inappropriate frequency and timing of mowing (during blooming), herbicide applications in close proximity to plants, and herbivory by cattle. Project modifications that minimize effects to the Neches River rose-mallow (e.g. building cattle exclusion fencing and controlling timing of grazing, restoring altered ponds to more natural conditions, effectively controlling woody species on highway right-of-ways (ROWs); and clearing and burning to remove Chinese tallow to maintain adequate levels of open canopy) would also minimize effects to the PCEs associated with Neches River rose-mallow's proposed critical habitat.

Therefore, in proposed critical habitat it would be unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat and measures needed to avoid jeopardizing the species. Both of these species have very specific habitat requirements, and are closely tied to those habitat conditions. That is the reason it is difficult to envision a scenario where the effects to the species would not be similar to the effects on critical habitat.

Conservation plans and regulatory mechanisms that provide protection to the species and its habitat without critical habitat designation

Concurrent with the proposed designation of critical habitat, the Texas golden glade and the Neches River rose-mallow have been proposed for listing as endangered and threatened, respectively, under the Act. Listing provides opportunity for conservation and protection under sections 6, 7, 9, and 10 of the Act. These include cooperative actions with States, consultation with Federal agencies for actions that may affect the species, prohibitions against collection of listed plants and their parts from Federal lands without special permits, and cooperative habitat protections with other entities and landowners.

Texas state law does not provide protection for either species because they are not currently State listed as endangered or threatened. Texas state law protections for State (includes all Federally listed species) listed plants involve prohibitions on removal of such plants for commercial sale; precluding any taking of endangered or threatened species from public lands for commercial sale, with similar prohibitions on taking from private land unless first obtaining a permit; therefore no habitat

protection is provided with State designation of the species. In summary, there are no protections for either species under Texas state law.

There are no conservation plans in place that specifically address the gladeceess however; the Forest Service manages for Neches River rose-mallow and its habitat under a Land and Resource Management Plan (see the discussion below on the U.S. Forest Service). The Texas Land Conservancy purchased and manages one tract of private land for the Neches River rose-mallow. This 30 ac (12 ha) tract provides overall benefits to 3.3 percent of the rangewide population of Neches River rose-mallow. It is considered part of the baseline because these benefits will continue with or without critical habitat designation. The Texas Land Conservancy tract known as the Hibiscus Preserve (informally as Lovelady), is located in Houston County in east Texas. This tract contributes toward the rose-mallow's conservation by protecting a population of the rose-mallow and its' habitat; thereby minimizing development and maintaining the ecological values of the land for Neches River rose-mallow.

Federal Regulations/Acts

The following Federal laws and regulations provide some benefits to the gladeceess and rose-mallow and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

1. National Forest Management Act

The National Forest Management Act of 1976 directs that the National Forest System "...where appropriate and to the extent practicable, will preserve and enhance the diversity of plant and animal communities."

Federal Land Management

The following Federal agencies own and manage lands within some of the areas designated as critical habitat for Neches River rose-mallow. Their ongoing land management activities are considered part of the baseline because they will provide some benefits to the species with or without critical habitat designation. For those future proposed activities that may affect Neches River rose-mallow or its critical habitat, section 7 consultation will occur and in some circumstances these consultations may be considered as part of the incremental effects of critical habitat designation (see further discussions that follow). With regard to Texas golden gladeceess, it does not occur on Federal land.

1. U.S. Forest Service

The Forest Service actively manages habitat for the Neches River rose-mallow. Four populations comprising a total of 81.5 percent of the rangewide population are known to occur on the Davy Crockett National Forest (NF), including one of the most robust populations. The Davy Crockett NF Resource and Land Management Plan allows for mechanical means and prescribed fire to maintain the native plant community but prohibits the use of chemical agents (herbicides) unless applied by hand or through nonaqueous form within 100 ft (30.5 m) of Neches River rose-mallow.

Federal agencies and other project proponents likely to consult with the Service under section 7 without Critical Habitat

Federal agencies and projects that would likely go through the section 7 consultation process if no critical habitat is designated include the following:

1. U.S. Department of Transportation (highway and bridge construction and maintenance).
2. U.S. Fish and Wildlife Service (Partners for Fish and Wildlife program projects).
3. U.S. Forest Service (fire suppression, fuel-reduction treatments, land and resource management plans, potential oil and gas wells and pipelines, nonnative invasive species treatments, and travel management).
4. U.S. Department of Agriculture's Natural Resource Conservation Service and Farm Services Agency (technical and financial assistance for timber and poultry production and wildlife habitat improvements).
5. Federal Energy Regulatory Commission (issuance of permits for interstate pipelines).
6. U.S. Department of Housing and Urban Development (grant funding for municipal and residential construction and infrastructure projects in small cities and towns).
7. U.S. Army Corps of Engineers (permits for wetland crossings that are part of linear projects such as roads, transmission lines, or pipelines; permits for activities in jurisdictional wetlands).
8. Department of Homeland Security's Federal Emergency Management Agency (disaster response).

Service administrative effort for section 7 consultations without critical habitat

To date, no section 7 consultations have occurred for either species because these species have not yet been listed under the Act. Texas golden gladeceess, however, was mentioned as a candidate species in a formal section 7 consultation for the Federally listed endangered *Physaria pallida* (white bladderpod), a species with which the gladeceess sometimes co-occurs. For this particular project, no impacts to the gladeceess were expected from the State highway widening and improvement project because the species was not present. However, the conservation recommendations for white bladderpod including minimizing destruction or harm to the plants from unnecessary foot or vehicle traffic, invasive species introductions, or mowing during active growth seasons, would also benefit Texas golden gladeceess. Similar conservation measures would be recommended in the event of future highway ROW projects in or adjacent to gladeceess populations. Texas golden gladeceess was also included in an intra-Service section 7 consultation for a Partners for Fish and Wildlife Program project in San Augustine County, done for the purposes of restoring habitat for white bladderpod and gladeceess. Pesticide recommendations included buffers of at least 200 yards from suitable habitat when using any of 12 listed pesticides, as well as restricted timing of Grazon P+D herbicide application to between July 1 and August 31, and then only applied in spot treatments. Seasonal burns were prescribed for purposes of removing encroaching woody vegetation from glades with a recommended timing of July through October (non-bloom period). Additional management recommendations addressed leaving gopher mounds intact (benefits white bladderpod) and using

grazing practices that entail seasonal moderate grazing, preventing overuse of glade areas by livestock, and seasonal cattle exclusion from glades from January through March for gladecress.

What types of project modifications are currently recommended or will likely be recommended by the Service to avoid jeopardy (i.e., the continued existence of the species)?

Because these two species were not listed prior to this proposed rule, we do not have a history of section 7 consultations for rose-mallow, and the section 7 history for gladecress is limited, so there are not extensive lists or descriptions of associated project modifications to guide our incremental effects analysis, except as discussed above. We can predict to some extent what these modifications and measures may be based on section 7 consultations for similar plant species. In Texas, for our other listed plant species without critical habitat, we recommend that proposed projects requiring section 7 consultations avoid plants by conducting preconstruction surveys, typically when plants are in bloom for easier identification, flagging live individuals or a whole population in the project footprint, and having a biological monitor on-site to stop activities and coordinate a solution with the Service if a listed plant may be impacted during project-related activities. We will also recommend projects be conducted at various distances from individual plants to protect their habitat and, in some instances when construction of a pipeline has been proposed, we may also recommend directionally drilling. We recommend these distances based on the best available information on associated project impacts (both direct and indirect), habitat requirements, the potential for genetic exchange, and pollinator requirements. Because the gladecress is known to occur with the white bladderpod at some sites, measures and modifications proposed for the bladderpod may be instructive and are thus included as follows: Mechanical removal of woody encroaching vegetation is done in fall months during the bladderpods' (and gladecress') dormant period and is limited to dry conditions to prevent rutting and soil disturbance at the site. For projects in highway ROWs, creation of "no work areas" within existing populations protect plants from foot traffic and vehicles, as well as prohibiting staging of materials and equipment. Following project completion, the portion of the ROW containing the population is maintained during the plant's dormant season to keep invasive species out. Reseeding of disturbed or newly deposited substrate is done with native plant species to avoid introduction of nonnatives.

If we determine that an action jeopardizes the gladecress or the rose-mallow in future section 7 consultations, recommended project modifications could include one or more of the measures below, depending on the proposed action. This is not an exhaustive list.

1. Implement seasonal restrictions or modifications to projects occurring within occupied habitat to enable recovery of the species.
2. Provide conservation measures to restore, enhance, and protect habitat within the critical habitat units.
3. Incorporate a range of "best management practices" to protect species and its habitat.
4. Implement *in-situ* conservation to reintroduce individuals within occupied habitat coupled with long-term adaptive management monitoring.

5. Offset permanent habitat loss, modification, or fragmentation resulting from agency actions with habitat that is permanently protected, including adequate funding to ensure the habitat is managed permanently for the protection of the species.
6. Habitat loss, modification, or fragmentation of Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands. (In other words, lands protected as mitigation from habitat loss should not be Federal lands that are already under some form of protection or management).

Incremental Effects Analysis

The following discussion describes the regulatory circumstances that are anticipated with designation of critical habitat for both species. Once critical habitat is designated, section 7 of the Act requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat. The key factor related to the adverse modification is whether, with implementation of the proposed Federal action, the affected critical habitat will continue to have the capability to serve its intended conservation role for the species. From section 3(3) of the Act: "The terms "conserve," "conserving," and "conservation" means to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Endangered Species Act are no longer necessary". Thus, designation of critical habitat helps ensure that proposed project actions will not result in the adverse modification of habitat to the point that the species will not be able to achieve recovery, *i.e.* not able to be removed from the threatened or endangered species list.

The same eight Federal agencies listed above under the baseline analysis are also anticipated to be the primary agencies that would consult with the Service under section 7 for both species. We expect consultation to primarily involve actions occurring within critical habitat for both plant species that could disturb, degrade, fragment, or eliminate their habitat (also listed in the proposed rule, 77 FR 55967, September 11, 2012). Avoidance and minimization recommendations made during section 7 consultations for either species, both within or outside of critical habitat, would essentially remain the same, however, there may be an additional analysis needed to determine adverse modification.

All proposed critical habitat units for both species are occupied with no unoccupied units being proposed for either species. The Neches River rose-mallow critical habitat units include the primary constituent elements throughout, although in some units the plants themselves are scattered or sometime localized within parts of the unit. The presence of the PCEs ensures areas for seed dispersal as well as areas for the plants to spread into. There are a few situations where the PCEs may be affected, but no plants are present; thus, there will be incremental effects due to the need to consult on the effects to proposed critical habitat. For example, if a small wetland fill is limited in size and placement such that it does not affect any of the Neches River rose-mallow plants within that unit, but disturbs the PCE's in that limited area, any modifications or mitigation related to that project would be incremental due to the designation of the critical habitat.

The physical and biological features and the PCEs required by the gladecress occur throughout the entirety of the four critical habitat units, however the plants are not present on all outcrops. Within gladecress' four units, due to the small areal extent of the populations, and the scattered nature of the outcrops and glades on which the species depends, projects that may affect the physical and

biological features in some places within the unit may not be close enough to jeopardize the populations. We believe that incremental effects will be most likely to occur within portions of the gladeless critical habitat units where the gladeless plants are not actually found.

The following activities that could occur in these critical habitat units and be evaluated under section 7 consultations for either species, include: Use of persistent, pre-emergent herbicides for brush control programs; mechanical or chemical (herbicides) treatments or prescribed fire for nonnative species control; conversion of pastures and forests with glades to pine tree plantations; installation of interstate pipelines and associated infrastructure; highway improvements and maintenance, including staging of vehicles, equipment, and materials on ROWs, as well as the timing of mowing and herbicide use; construction of buildings and residential infrastructure, such as water lines; pipeline or transmission line crossings of wetlands and ROWs; dredging, draining, or alteration of wetlands; other activities altering the natural wetland hydrology; and disaster response activities that include cleanup/removal of debris.

Because of the scattered nature of the plants and the specialized habitat within the proposed critical habitat units for both species, there may be incremental project modification costs that would be attributable to the designation of critical habitat and additive to incremental administrative costs. In these cases, we believe a reasonable method to determine the potential incremental economic impacts of these activities would be to assume that if activities with a Federal nexus would alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the gladeless, the costs associated with conservation measures implemented to mitigate those impacts would be attributed to critical habitat designation. In cases where we determine that an adverse modification finding may be likely, we would work with the Federal agency involved to identify reasonable and prudent alternatives that would eliminate or reduce those impacts to a point where adverse modification is no longer likely. The resulting project modifications would appropriately be considered an incremental cost of the critical habitat designation.

In summary, although the outcomes of individual consultations under section 7 of the Act will vary, we believe the potential incremental impacts of the proposed critical habitat are:

- In areas where uncertainty exists over whether one of these plants is currently present at a specific site and there is resultant uncertainty as to whether a proposed project is likely to adversely affect one of these species, the existence of critical habitat may make this point moot and result in section 7 consultation with the associated costs and additional administrative effort. This is true for the Texas golden gladeless; a plant that is small in stature, with a window of flowering and producing fruit that is limited to between February and early April, making it is difficult to find. Additionally, the species may not emerge in a given area during a given year because of drought conditions, thereby increasing the uncertainty over whether habitat is occupied. For the rose-mallow, this is unlikely because the plants are distinctive enough to identify and locate within their habitat year-round, even in drought conditions.
- Some specific project sites within the limits of critical habitat may occur in areas where the plant has not been found or seen, but the PCEs are present and adverse effects to critical habitat may occur in areas where there would be no adverse effects to the plants. In such cases, costs related to section 7 consultations could be attributed to the designation of critical habitat. This is especially true in areas with primary constituent elements for the gladeless.

In the case of the rose-mallow, this may only be true in the few units where plants are localized in a part of the critical habitat unit rather than equally distributed throughout.

- In rare instances a project would not jeopardize the plants but would result in adverse modification of critical habitat. The costs of implementing reasonable and prudent alternatives would be attributable to critical habitat.

Conclusion

In summary, it is likely that the incremental effects of the proposed designated critical habitat for the Texas golden gladeceess and the Neches River rose-mallow will be limited to scattered areas within their critical habitat units where the plants may not be present but the PCE's are; resulting in consultations that would not be required if critical habitat were not designated. We anticipate the following incremental effects: (1) an increased workload for action agencies and the Service to conduct re-initiated consultations for ongoing actions; (2) new consultations from project proponents that previously did not consult but may be required due to proposed critical habitat; and (3) possible project modifications to avoid adverse modification of critical habitat in areas where a significant alteration of habitat is proposed.

**APPENDIX C | UNDISCOUNTED STREAM OF COSTS FOR EACH SPECIES BY
AGENCY AND PARTY**

EXHIBIT APPENDIX C-1. UNDISCOUNTED COSTS BY AGENCY AND PARTY FOR NECHES RIVER ROSE-MALLOW (\$2012)

NECHES RIVER ROSE-MALLOW	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
TxDOT-Service	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
TxDOT-Federal Agency	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
TxDOT-Third Party	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
TxDOT-Biological Assessment	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
TxDOT-Total Costs	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740
USACE-Service	1,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USACE-Federal Agency	1,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USACE-Third Party	880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USACE-Biological Assessment	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USACE-Total Costs	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USFS-Service	0	610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USFS-Federal Agency	0	780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USFS-Third Party	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USFS-Biological Assessment	0	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USFS-Total Costs	0	1,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RUS-Service	0	610	610	0	0	610	610	0	0	610	610	0	0	610	610	0	0	610	610	0
RUS-Federal Agency	0	780	780	0	0	780	780	0	0	780	780	0	0	780	780	0	0	780	780	0
RUS-Third Party	0	510	510	0	0	510	510	0	0	510	510	0	0	510	510	0	0	510	510	0
RUS-Biological Assessment	0	500	500	0	0	500	500	0	0	500	500	0	0	500	500	0	0	500	500	0
RUS-Total Costs	0	2,400	2,400	0	0	2,400	2,400	0	0	2,400	2,400	0	0	2,400	2,400	0	0	2,400	2,400	0

EXHIBIT APPENDIX C-2. UNDISCOUNTED COSTS BY AGENCY AND PARTY FOR TEXAS GOLDEN GLADECRESS (\$2012)

TEXAS GOLDEN GLADERESS	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
TxDOT-Service	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900
TxDOT-Federal Agency	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TxDOT-Third Party	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
TxDOT-Biological Assessment	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770	770
TxDOT-Total Costs	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
PFW-Service	0	0	0	22,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PFW-Federal Agency	0	0	0	380,000	0	0	32,000	0	0	32,000	0	0	32,000	0	0	32,000	0	0	32,000	0
PFW-Third Party	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PFW-Biological Assessment	0	0	0	18,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PFW-Total Costs	0	0	0	420,000	0	0	32,000	0	0	32,000	0	0	32,000	0	0	32,000	0	0	32,000	0
RUS-Service	1,800	0	0	0	1,800	0	0	0	1,800	0	0	0	1,800	0	0	0	1,800	0	0	0
RUS-Federal Agency	2,300	0	0	0	2,300	0	0	0	2,300	0	0	0	2,300	0	0	0	2,300	0	0	0
RUS-Third Party	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0
RUS-Biological Assessment	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0	1,500	0	0	0
RUS-Total Costs	7,200	0	0	0	7,200	0	0	0	7,200	0	0	0	7,200	0	0	0	7,200	0	0	0